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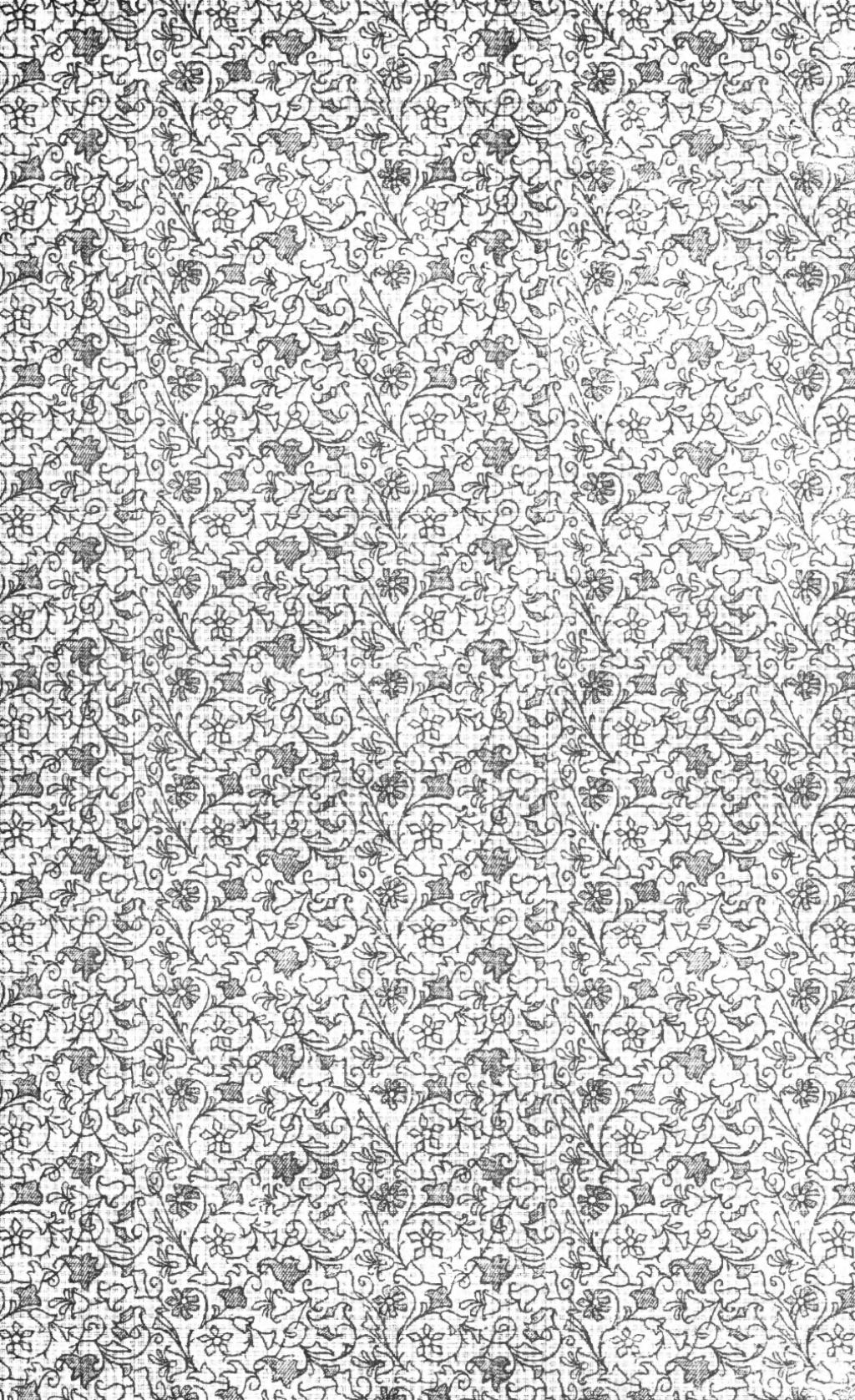


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THE HEREDITY OF

Dual Purpose Cattle

A Study in Farm Economics

Based on Red Polled Records

From 1808 to 1915 



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By HENRY F. EUREN
Founder of the Red Polled Herd Book
Owner 15 Years; 25 Years Editor

THE RED POLLED CATTLE CLUB
OF AMERICA
FOUNDED NOVEMBER 24, 1883

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THE RED POLLED SOCIETY
OF GREAT BRITAIN AND IRELAND
FOUNDED APRIL 21, 1888

PREFACE

The fact that full particulars of the formation and development of a new breed of cattle in the last century are yet available is my apology for presenting the following essay on the Heredity of Dual Purpose Cattle as illustrated by the Red Polled. In preparing the facts and figures which are set forth in the narrative, I have been fortunate in working upon a system of registration of pedigree unlike any form that existed before the year 1874. The plan was feasible from the fact that the Norfolk and Suffolk Polled Cattle were not being bred outside the borders of the two counties. Also that it was possible to glean evidence from men who had both seen and aided in the interfusion of the old variety and the new; that had been skilfully evolved from the mixture of two types of cattle that had existed in Norfolk from the olden time.

That the new variety has won a permanent place in the world is evidenced by the fact that while in 1874 there were only four Red Polled Cattle in America, and these imported in the previous December, the issue of the American edition of the Herd Book, which contains names, number, and pedigree of the cattle born in the year ending December 31st, 1915, contains the register of Bulls 27083 to 28851, of Cows 40265 to 42651. At the close of the year 1889 there were 132 bulls and 276 cows. In the following three years, when American breeders had begun a co-operation of registration with the British, the number had been increased by 849 bulls and 996 cows. Of the total register in Vols. 7 to 18, the American registry was some 7,500 bulls and 9,000 cows. The Red Polled Cattle Club of America had its separate register as from January, 1901, opening with the bull register number 8909, cow register number 17878. There has thus been an increase in the last fifteen years of Red Polled Cattle in use in the United States (a very few only in the Dominion of Canada): Bulls 19,943, cows, 24,774.

Professor C. H. Eckles, of Missouri, in his book on "Dairy Cattle and Milk Production," says of the Red Polled in America:—

"They have won their way entirely by their merits, and are increasing rapidly in those States where dual-purpose cattle are in demand. They are the most typical and most popular of the real dual-purpose breeds."

Further evidence of the practical value of the breed as it has spread abroad in the United States is seen in the pages now laid before the student of Farm Economics. The Cattle Club Directors, being

informed that I was preparing an essay on the progressive development of the breed in its several aspects, readily assented to the Club's aiding its issue, in print—a resolution for which I most heartily thank them.

Four and twenty years ago it needed a protest, through an influential live stock journal, to compel an American official to do justice. A few men had sent their Red Polled cattle to Chicago to compete in a Farmer's Cow class. The upholders of some other breeds manifestly sought to kill rivalry, and hoped to do so by ignoring the new-comers. But the truth had to be made known from the "misplaced" papers on which was the noting of points by the judges. In the following year the trick was more cleverly arranged. And from the year 1903 there has been no Farmer's Cow class. That "taboo" was the determination would seem to be evidenced by records of tests and experimental trials made in the United States and in the Dominion of Canada. But the couple of sentences quoted above, from Prof. Eckles, show that the lowly men who knew their business have held on their way, and have won in the contest. The Jean Du Luth Farm managers have also set a much-needed example by their resolve, as from Jan., 1911, to make whole-herd records, and to systematize the tests for Advanced Registry. It is an unquestionable fact that the Red Polled has come to stay, with Dual-Purpose written on the breed's banners. So much for America.

On this side the Atlantic one regrets to say there has been much less determination to uphold a good cause. From the year 1891—three years after the Red Polled Society was formed and acquired the Herd Book—the Council, recognizing that the inherited qualities of the cow as a milk and butter producer was a matter of great importance in the selection of a bull, not only printed the milk records without any charge to the owner of the herd, but also issued separately the pages containing the records, with live weights of fatted steers and heifers, as the best means of advertising the merits of the Red Polled. This was the practice until the close of the 1907 record. For some time past, however, an advertising rate has been charged for the publication of the year's milk; and there is no record of the live weights of cattle at the Norwich and Smithfield Club shows. "Dublin Castle" controllers of aided agriculture in Ireland have from the beginning of their muddling not cared to know of the existence of the Red Polled. A Co. Mayo breeder quoted in this essay has made that plain. English officialism has copied "Dublin Castle." It knows nothing of the facts and figures which are presumably the base of a farm economy that is to be an advantage to the community as well as a profit to the land cultivator. It has refused to acknowledge the "Red Poll" Society when it asked to have its 30 years old systematic milk recording recognized, as it recognizes much more recent and less complete plans. And by other devices there would seem to be an endeavor to foster the interests of a section at the cost of the mass,

in the expectation thereby to do for the Red Polled breed what has been done for the Yorkshire Polled, the Irish Polled, and other varieties of cattle which were doing good service before the Shorthorn was in existence.

I ask the consent of my readers to a challenge of an impartial investigation of my assertion that the battalion of Facts and Figures drawn up in their varied ranks in this essay uphold the declaration of the Missouri professor that the Red Polled cattle are "The most typical of the Real Dual Purpose Breeds."

Red Polled Cattle have been exported to South America, South Africa, Australia, and to other distant lands, while at home they are extending the area of their influence.

It has been my aim in presenting the long array of Milk Records to show what progress has been made in a section of Farm Economics which has been well-nigh neglected. An endeavor to create a sensation, by publishing a big record made in a year, has been all too common a fault, and the principles of evolution have been almost forgotten. Where I have set down an average of yields, the annual total yields have varied but little during the period named; exceptional returns being quoted apart, and not included for the making of a heavy average. In all cases the number of days when milk was yielded is stated within parentheses, so that the duration of the lactation period can be known. As evidence that a record of one day's milk yield in each week, carried on during the days of lactation, will approximate to the year's record, I have given in full the daily yield in 1882-3 of the young cow 1451 Davy 27-H1. That the hardly less important recording of butter-fat contents may be truly estimated by a couple of brief trials the Vermont Experimental Station has demonstrated. Its conclusions are quoted in the supplementary pages of the essay. A photo-snapshot of the fully developed cow, kept for use, should complete the breeder's knowledge whether there is progress, or a standstill, which means loss of capital.

The not less important question—from the view of the believer in Farm Economics—of the cost of food consumed has been under examination and test for many years at American University Experiment stations. At the Minnesota Station such work has been carried on from 1893. The bulletins unfortunately, ignore the Dual-Purpose cow. Possibly it will now have its turn. Then, there should be a good practical manual made ready for the British farmer. I have in a supplement to the essay, tried to cast some light on the food question by re-printing results which were the outcome of the Buffalo Pan-American Exposition Six Months Test in 1901. Averages of each of the ten breeds were quoted at the time. But for a knowledge of what the test really meant, I have given the return by each of the fifty cows: Fifteen dual-purpose cows, twenty generally recognized as dairy cows, and fifteen localized as such.

My thanks are due to Mr. R. Harvey-Mason, of Necton Hall; Mr. C. F. Newton, of Saham Toney, Norfolk; Mr. J. B. Chevallier, of Aspall Hall, Suffolk; Mr. Fraser Meadows, Thornville, Co. Wexford; Mr. Ralph E. Macan, Agent at Longford Castle, Wilts., and Mr. G. P. Grout, of Duluth, Minn., for material by which to complete my records. My detailed list of Milk Records, and my Full Pedigree tables with a Breed Analysis of each of the Cows and Bulls named there, will be available to students of heredity in the local collection of the Norwich Public Library, on whose shelves is a complete set of the United Kingdom Red Polled Herd Book.

Breeders of Red Polled Cattle and students of Farm Economics can hardly fail to detect an inaccuracy here and there in the array of figures quoted from so large a mass of detail as that contained in the records of milk, butter-fat and beef, from which I have had to glean facts and figures. There has been a triple revise, and I trust this, my striving after accuracy, will be accepted as an apology for faults discovered. No small proportion of the credit for a clean page is due to Mr. George Abbs, the linotype operator and mechanic, in the employ of the "Norwich Mercury" Co., Ltd., who has striven to do his best:—"Honor to whom honor is due" in a task the like of which few men are called on to undertake.

Henry F. Euren.

The Inheritance of Dual Purpose Cattle

Before there is a consideration of the modern uses of cattle a brief statement of old-time practice may not be out of place.

James E. Thorold Rogers, some time M. P., also Professor of Political Economy in the University of Oxford, in 1866 began publication of "The History of Agriculture and Prices in England," facts and figures collected from records extending from A. D. 1258-9 to 1702-3. In 1884, "Six Centuries of Work and Wages: The History of English Labor," admirably presented these researches for the instruction of the general public. His lectures on England's Economic History, as delivered at Oxford, yet more fully illustrated what it is desirable to be known of the Rise and Progress of more than one branch of Farm Economics.

When Rome sought and ultimately won a footing in England they found there a great number of cattle. Probably they were being used in the cultivation of land—as was yet the practice when the 19th century opened. It is on record that Seneca, the philosopher, when he was Nero's helper in the government of the Roman Empire, enticed the Erceni and others of the Brythonic folk tilling the East Coast lands, to "borrow of him vast sums upon fair promises of easie loan, and for repayment to take their own time, then on a sudden compelling them to pay all at once with great extortion." This may be taken as an illustration of the hazards which were the portion of the worker on the land while under the domination of Rome. When the Angeln folk took possession of the lands the natives who survived were enslaved, and became "landless men." The new settlers, having somewhat superior cattle, would use them as producers of milk, butter, and cheese, as well as in the ploughing of their land. In their turn, the English lords, when degraded by their Norman conquerors, who henceforth ruled the peasantry, increased the number of "landless." Thorold Rogers says farm and manor accounts are numerous from "about the last ten or twelve years of the reign of Henry III," and the handwriting tells the expert the date "within a few years, whether its origin be Lancashire, Kent, Warwickshire, Norfolk, or Northumberland. . . . No other country possesses such a wealth of public records."

We thus know that the serf had the use of some 12 acres of arable land with live stock thereon, and as a part of his rent had to till at least half an acre of his lord's land, while the cottagers were for the greater part of the year free laborers. In the course of time these landless folk acquired right of possession to the use of the lands they cultivated, and to the keeping of their cattle on the unenclosed lands—which in the course of years were termed common lands. Mr. Rogers says:

The ox was kept for plough and draught, a few were kept for fattening, but I consider that the amount of stock regularly fattened for the table was a very small percentage of the whole. They would be consumed only by wealthy nobles and wealthy corporations, and as a matter of fact, fresh beef was put on the table only for a few months in the year. Much was killed and salted in November, but this beef was of grass-fed cattle. The ox, quit of skin, head and offal, did not weigh on an average more than 400 pounds, and was worth about 11s. to sell. There was no attempt to improve the breeds of cattle. The maintenance of the bull was a necessity, and the use of the cow was for the dairy. I do not assert that there were not different breeds, but I am sure that the difference was in the size, not in the quality of the animals, and that there was no distinction made in the character of the breeds.

There was hardly a sensible difference between these old rates at which farm stock was sold and those when the 14th century closed. Dairy products were a little cheaper. In the course of time sheep breeding became the more profitable to the husbandman. The cottager found his advantage in his cow on the common until common lands were enclosed, in the 18th and early part of the 19th century, and the era of high rents and low wages set in.

THE NEW DEVELOPMENT

Dual Purpose is a modern descriptive term. When applied to a cow it is expressive of her inheritance of a tendency to yield milk that has a fair percentage of fat as a constituent of its solid contents, and an equal tendency to lay on flesh when fed for that particular purpose. It would seem to have been the ideal of the first improvers of the Longhorn Cattle of Derby—Sir Thomas Gresley and Mr. Princep. Their ideal was fairly attained. But their successor in the work, the famous Robert Bakewell, of Dishley, Leicestershire, sought rather “the qualifications of beauty and utility of form, quality of flesh, and aptitude to fatten,” neglecting to accompany these with the fostering of the equally important milk inheritance. Bakewell’s methods of selection and in-breeding, as a means of improving cattle, are said to have been attractive to the brothers Charles and Robert Collins, who applied them to what was then known as the Teeswater breed, later as Durhams, after Charles Collins had, in 1783, visited Dishley. Some twenty years later Thomas Booth, of Killerby, and Thomas Bates, of Kirklevington, severally continued the work of improving the Durham, by then termed the Shorthorn. Booth held to the Collins ideal, Bates preferred that of the dual purpose. At the same time John Reeve, of Wighton, Norfolk, began his work, first by hybridisation and then by selection, practically following on what we now know as the Mendelian law. His ideal corresponded with that of Bates, but his material was of quite another type, so that the dual-purpose cow would seem to have been the Reeve ideal from the outset. Some two years before he retired from farming he selected of “Durham” stock a young bull and five cows. He may have desired to try his ideal on this variety of cattle, but he could not carry it out, for they were sold with his other live stock in October, 1828. Sir Charles Knightley, at Fawsley, held to the dual-purpose in the Shorthorn herd which he built up in thirty years from about 1826, attaining “a splendid uniformity of type and abundant milking properties.” Mr. R. W. Hobbs, of Kelmscott, is quoted as saying: “I consider that the Shorthorn should be a dual-purpose cow; that is, she should give a good quantity of milk, and, when dry, quickly make a good carcass of beef; and in this capacity the dairy Shorthorn is excelled by no other breed.”

For some fifty years after the judges for the Royal Agricultural Society, in 1839, set what they deemed to be the standard points of Shorthorn cows and heifers that were competing as breeding stock,

the tendency was in the direction of the Booth ideal. Judging, year by year, at most shows was thus on lines that, on the whole, corresponded with those that governed awards at the Smithfield Club annual shows. In many herds, where fashion did n't rule, however, the dual-purpose was upheld. In recent years it has been more in favor, but with too little attention to the fact that inherited qualities may not be notable in every succeeding generation. "Like begets like" is not always in evidence. The milk and its butter-fat record should therefore be the rule for every cow in the herd. This was the rule in Lord Rothschild's Shorthorn herd at Tring Park from 1899, when it was added to the then existing herds of Jerseys and Red Polled, where milk recording had been maintained from October, 1891, with published lists year by year. Red Polled milk records of each cow's production in the herd began as from May 1st, 1886, and continue to this day. Moreover, as will be seen from following pages, there has been such a form of registration with group letters and family numbers that it is an easy matter to note the milk inheritance, whether it be through the dam or as influenced by the sire. The beef-making aptitude of a steer or heifer may be as systematically noted by the percentage of increase of live weight, as estimated by a comparison of the recorded weight of the same animal when competing two years in succession. This is the only true means of reckoning, since the live weight of the calf usually varies according to the breed of the dam and sire.

The qualities of beauty and utility of form, of respective types and breed of cattle, can now be seen pictured frequently, for the public, by photo process, and comparative estimates be determined. The money value of the other qualities can be determined by the net profit of milk and butter sold, when the cost of food is set down, or by the price per stone (of 8 lb. or 14 lb.), at which the fatted animal is bought by the trader at public auction.

JOHN REEVE'S IDEAL: RED POLLED CATTLE.

Just one hundred and ten years ago a tenant on the Holkham Estate, in North Norfolk, began to experiment on the hybridisation of cattle. John Reeve, a man then in his prime, had held Wheycurd Hall Farm, Wighton, by lease, since 1786. Thomas William Coke—"Coke of Holkham"—was a man who knew and valued a good tenant, though they differed in opinion in regard to cattle and sheep. John Reeve was one who evidenced independence; he bred neither Devon cattle nor Southdown sheep, which varieties of live stock Mr. Coke held to be the most suitable. Yet a new 21-year lease had been agreed on in 1806. Mr. Coke, at the Holkham Sheep-Shearing Dinner, to guests and tenants, presenting John Reeve the silver cup as breeder of the best Leicester wether said:—

He could not neglect that public opportunity of returning his best thanks for the attention Mr. Reeve had paid to the improving his meadows by irrigation. He wished the public to notice that Mr. Reeve had expended 930 pounds on 35 acres of land; that he (Mr. Coke) had asked him if he, the landlord, should pay the expense, and fix such an additional rent as would procure him a fair interest for that expenditure; and he was happy to assure them that his tenant had preferred retaining the land without any advance of rent, and declared that he would soon be repaid the whole principal, and that he should be amply rewarded, in having made that improvement, by the extraordinary increase of produce.

Arthur Young, in his "General View of the Agriculture of Norfolk" (1804) had said of John Reeve:—

Every idea of this most accurate farmer merits much attention (p. 261). Mr. Reeve's farm is in such order that attention should be paid to his practice and opinions (p. 276). He may, perhaps, be considered as prince of grass land improvers: he has very few rivals that have come to my knowledge (p. 375).

John Reeve told Young that "he had kept a large dairy of cows," but thought them "the worst stock that can be kept on a farm, as turnips are drawn for them instead of being fed on the land, and more straw is eaten by them instead of being trodden than by any other stock." It is also evident that the two agriculturists had discussed the relative worth not only of Leicester and Southdown sheep, but also of varieties of cattle, for Arthur Young could not fail to tell Reeve that he had

viewed a dairy at Mileham, Mr. Carrington's, the only one left in the country of the true old Norfolk breed of cattle middle-horned, color red, in some not much unlike the Devon; as loose and ill-made as bad Suffolks.

He quoted Marshall as "giving a much more favorable idea of those cattle" which he had seen in northeast Norfolk in 1780-2. It may be presumed that Reeve, in 1804, had thus learned from Young that, within a few miles, he might yet find the means of improving Norfolk cattle, rather than by adopting Devons or Durhams. The Norfolk Poll-book, of 1806, shows Reeve voting as "freeholder and occupier" at Wighton; in that of 1815 as "John Reeve, gent., freeholder and occupier;" and in 1837, nine years after he had retired from farming, as yet "freeholder and occupier" at Wighton.

THE MATERIAL

East Anglia, the name applied to the Norfolk and Suffolk area, is almost an island. Its cattle thus were, down to the early years of the 18th century, less likely to be a mixture of breeds than in most other parts of the Kingdom. Moreover, there prevailed a strong feeling of antagonism against "off-comes" (to use an old English compound); and even fifty years ago "come from the shires" was an expression of stout opposition. Cattle which were supposed to be descended from old-time farm herds were termed "Home-bred." John Lawrence, a Colchester man, who had farmed near Bury St. Edmund's, in his "General Treatise on Cattle" (1805, 2d ed. 1809), says:—

NORFOLK HOMEBREDS, so styled, since that county, from its great improvement in cultivation, has ceased to be much of a breeding one, having found it generally more advantageous to purchase, are found, nevertheless, to graze earlier and quicker than either the Scots or Welsh, so much in use in Norfolk: and no cattle are said to make better proof, or to bear a higher character with the Smithfield salesmen, than Norfolk homebreds.

Lawrence would seem to have had small acquaintance with the notes on Norfolk made by William Marshall thirty years earlier, or his evidence on "home-breds" would have been quoted. Strange to say, David Low, in his voluminous work "On the Domesticated Animals of the British Isles," is just as silent; though he was, in 1845, "Professor of Agriculture in the University of Edinburgh." He however, proves to be a good commentator on Marshall.

That the northeastern low-lying, well-watered, fertile district of Norfolk was settled from beyond the sea long before Roman administration had ended is evidenced by "Danish camps," to protect the settlers, being near to the streams, that in this olden time were navigable by "Viking" ships. It is thus that we may account for the "true old Norfolk breed of cows" which Arthur Young saw in 1804 in Mid-Norfolk and at Rainham, this last being a cow 36 years old, of which an oil painting was a few years ago yet at Rainham Hall.

"Mr. Marshall," a Yorkshireman who had farmed in his native county, began his most useful career, as an observant, constantly

enquiring reporter of local agricultural details, by being the agent of Col. Harboard on the Gunton Estate from August, 1780, to November, 1782. In Vol. I of his "Rural Economy of Norfolk" (1787), he generalizes the knowledge he had thus acquired; in Vol. II he recounts his many talks with East Norfolk farmers. He was not a dweller in the county long enough to permit of his inspecting and reporting on other districts. Norwich and St. Faith's—the latter place on the occasion of the then famous cattle fair—were the extent of his movement outside the Eastern Coast area. In his most interesting book he says:—

The native cattle of Norfolk are a small, hardy, thriving race, fattening as freely and finishing as highly at three years old as cattle in general do at four or five. They are small-boned, short-legged, round-barrelled, well-loined, thin-thighed, clean-chapped; the head, in general, fine, and the horns clean, middle-sized, and bent upward; the favorite color a blood-red, with a white or mottled face. The breed of Norfolk is the Herefordshire breed in miniature. . . . I have seen Norfolk spayed heifers, sent to Smithfield, as well as laid up, and as full in their points as Galloway or Highland "Scots" usually are; and if the London butchers be judges of beef, there are no better fleshed beasts sent to Smithfield Market.

Professor Low, writing of the Zetland (Shetland) Islands, reminds us that they were formerly Norwegian; and that the inhabitants, who were essentially Norwegian until the 17th century, spoke the Norse language. Of the Shetland live stock he says:—

The cattle are distinctly Norwegian in their characters, and a similar race extends to Iceland. They are small, but of very good form when pure, and fatten with great quickness when carried to superior pastures. Their horns are short, their skin soft, and their flesh is equal to that of any cattle produced in the British Islands. . . . The cows are tolerably good milkers . . . and in this respect they agree with the cattle of Jersey and the islands of the Channel which are likewise believed to be of Norwegian origin.

The East Norfolk settlers, the "by folk," whose place names and personal names abound all over the area, we may assume to have been Lachmanni, whom the Irish chroniclers termed "White Danes" as distinct from the Danars—"Black Danes," those who in the 8th century ravaged our lands.

When the Romans had left the East Anglian area, taking with them the Brython men-folk, to aid them in their struggles for power in Gaul, the Lachmanni must have taken possession of the, then numerous harbors and water-ways. Place names—Norwich, Lowestoft, Dunwich, Aldeburgh, Ipswich, and others—record it. The wooded, inland districts were of little value to the sea-rovers. A new element entered, after the Geotas had shown that they could master the Romano-Brythons and settled in Kent. The Englen, folk who dwelt on what was little better than a waste of heather and sand, in what we know as Schleswig, were not addicted to sea-roving and land-fighting. They, so Bede tells us—and he lived about a hundred years after, in an area that had been settled by Englen folk—brought over their slaves, their cattle, and all of their live stock, leaving their home land without any living thing, and so it remained for a very long time. That these Englen came in families, one after the other, is evident from their place-names, "ing," denoting a family settlement with its bordering woodland, "the mark;" ".-ham" denotes the later, and "-ton" the latest aggregation of families, until the East Coast was settled quite up to the Scoch border. Dr. E. A. Freeman, in his "Norman Conquest of England" (Vol. I, App. A.), shows that the Englen-name became the one name for the whole land, that which had been mastered by Geotas, Seaxan and Frisan, as well as that quietly settled by Englen-folk. Hence our "England."

The earliest settlers must have taken possession of the woodland of fairly rich soil, which extended some 25 miles westward from Dun-

wich, then the nearest harbor; that old port is now covered by the sea. The self-contained area, separated from the sea by the sea-rovers' settlements, became a famous dairy district of some 250 square miles, known as High Suffolk. The second group of Englen Migrants would appear to have entered by the, then wide Yare estuary, and taken possession of Mid-Norfolk, a woodland, fertile district watered by the Wensum, which flows through Norwich. Later Englen immigrants would seem to have taken possession of Lincolnshire, Yorkshire, Durham, and Northumberland, with much of the land westward.

As to the cattle, which according to Bede, the Englen brought across the North Sea: Herodotus asserts that the Scythians had in their lands cattle without horns, because of the cold, and Hippocrates says the Scythian chariots were drawn by oxen which had no horns. The Scythians, it is said, held the lands from the northern seas to Hungary. In 1869, Prince Leichtenstein visited Elmham, in Mid-Norfolk, to buy Polled cattle with which to infuse fresh blood into the cattle which had been from time immemorial on his Transylvania estate. The English animals were, he said, like those cattle in polled character and color. In the summer of 1888 I found cattle hornless, and others similar to those which Low says were the Shetlanders, in equal numbers in a Norwegian mountain farmyard, some three miles north of Stalheim. They had that morning given an abundant flow of rich milk, and the herd was just then to be driven to the saeter for pasture. In 1880 polled cattle were seen by a visitor to Iceland, which was settled from Norway in the 9th century. Photographs of polled cattle were sent home in 1884 by American consuls as representing live stock existing in named districts of northern and central Russia. It may thus be fairly asserted that the Englen folks' cattle were polled, and that those which were in the early years of the 19th century respectively known as the "Suffolk polled," "Norfolk polled," which last Lawrence says were "a most excellent breed, carrying vast "Northern and Yorkshire polled," which last Lawrence says were "a most excellent breed, carrying vast substance, and of great size," and as to which R. W. Dickson, M. D., in his "Improved Live Stock and Cattle Management" (1825), bears similar testimony, adding that such polled stock were to be found as far south as Cambridge, were descended from these new-comers of the 6th century.

William Camden, in 1589, wrote, in Latin, and published his "Britannia." It was Englished in 1610 by Dr. Philemon Holland. Therein we may read:—

Suffolk has a fat and fertile soil, with pastures as battable for grazing and feeding of cattle; and great store of cheeses are there made, which, to the great commodity of the inhabitants, are vented into all parts of England, nay, into Germany, France, and Spain also, as Pantaleon, the Phisitian, writeth, who stuck not to compare these of ours for taste both, with those of Placentia.

John Speed, in the "Theatre of the Empire of Great Britain" (1611), says:—

The commodities of this shire are many and great, whereof the chiefest consist of corn, cattle, pasturage . . . and as Abbo Floricensis hath depainted . . . above 600 years since, and now we find as he hath said, to which we may add their gain from the pail.

Daniel Defoe, in his "Tour through the Eastern Counties of England" (1722), says:—

At Woodbridge begins that part which is ordinarily called High Suffolk, which being a rich soil, is for a long tract of ground wholly employed in dairies, and then again famous for the best butter and perhaps the worst cheese in England. The butter is barrelled, or often pickled in small casks, and sold, not in London only, but I have known a firkin of Suffolk butter sent to the West Indies and brought back to England again, and has been perfectly good and sweet, as at first. . . . This

part of England is also remarkable for being the first where the feeding and fattening of cattle, both sheep and black cattle with turnips, was first practised in England.

Arthur Young having come into possession of the Bradfield Hall Home Farm (six miles south of Bury St. Edmund's), in the following January, 1786, visited Aspall Hall, the home of the Chevallier family, to make a close inspection of dairy farms and farming. His "Minutes" are printed in Vol. V, "Annals of Agriculture. They relate to twelve of the twenty-nine parishes which were the headquarters of the dairies of High Suffolk. He says of the polled cattle:—

The points they generally admire here, are a clean throat, with little dewlap; a snake head; clean, thin legs, and short; a springing rib and large carcass; a good loin, the hip-bones to lie square and even; and the tail to rise high from the rump. In respect to color no particular rule, except an idea that light ones indicate tenderness. In size a preference of small cows.

In his "General View of the Agriculture of Suffolk" (1792) he says: "This is the description of some considerable dairymen," and he varies it in some particulars. "The more noteworthy of these, "udder large, loose, and creased when empty; milk-veins remarkably large, and rising in knotted puffs to the eye," are notable yet, especially in the detail of milk-veins. "The best milkers I have known have either been red, brindle, or yellowish cream colored"—the old time designation of this last was "dun."

Marshall's analysis of the form of the Norfolk "homebred" applied to the form of the best Norfolk Polled of 1860, save that they were hornless, and that their milk-veins were largely developed. Not a few, however, were too high on the leg, with an uneven carcase, a narrow loin, and the backbone ridged. Young noted only one polled herd in his Norfolk "General View," and that would appear to have been a mixture of Suffolk and Scot, as it came from Euston, the Duke of Grafton's seat. Yet Michaelmas sale advertisements of farm stock—a great feature in an agricultural area—year after year, from 1778, evidence that there were in the county dairies of polled cows. Six such herds were sold in 1802; and in 1804, when Young was taking his "General View," no fewer than thirteen, most of which were on farms in Mid-Norfolk. Lord Sondes' Elmham Estate had only polled cattle. They had been the favorite "homebred" for nobody knew how long. When early in the 19th century he came to Elmham, Lord Sondes asked Mr. Coke's counsel as to what he knew only as "homebreds." The advice received was to hold to the stock. One who had been more than eighty years tenant of a farm at Gately, and was in his hundredth year when he died, on March 1st, 1872, said from his earliest recollection the only cattle on the estate were red and polled. At Elmham Hall, when I was making my enquiries for the first issue of a Herd Book, I was shown by Lord Sondes an oil painting, dated 1836, of two polled oxen which were bred and grazed on the Home Farm. The bullocks were depicted of a good red color, each had a spot of white between the fore-legs, white under the belly and on the jowl, and with a few white hairs in the tuft or crest of hair hanging over the forehead. An inscription read:—

Exhibited at Fakenham Agricultural Show, obtained two prizes, and allowed to be the best homebreds ever shown under four years old. Killed by G. Nicholson; weighed 187 st. 8 lbs.

The earliest mention in an advertisement of such stock as "Norfolk Polled" occurs in the year 1818. The cows declared to be "almost unequalled," were bred on the good land which bordered the county on the north side of the river Waveney.

THE EXPERIMENT

John Reeve had not ended his irrigation preparations when Young visited his farm. Reeve had told him that he "had kept a herd of dairy cows," which he had found to be wasteful stock. The 35 acres of prime pasture, the outcome of irrigation, might put dairying in a brighter place in farm economy. But then came in the fact that while there was a rapidly increasing demand for Norfolk "homebreds" for the London market, the practice of spaying "homebred" heifers, which had been pursued for many years, endangered it. Was it possible to breed a cow which would be prime both as a producer of milk and butter, and as dam of stock that from the butcher's point of view would be equal to the nearly extinct "homebred?" Marshall had put on record that the mating of the "Norfolk native, hardy, thriving cows" with the Suffolk polled bull gave "an increase of size and an improvement of form," but a diminution of hardihood and of the aptitude to fatten quickly at an early age. Further, he held that what we term environment—the "soil, climature, and system of management" should be a primary consideration. We may be sure that Reeve pondered the problem.

It was then the custom of the Norfolk farmer to ride on his cob to Norwich for the Saturday market. There he might take counsel with men who had full knowledge of the "homebreds." Such men were not rare. We have in the record of the Holkham Sheep Shearing dinners, that Mr. Coke, in 1812, read the award of two farmers who acted as judges in a contest at Hopton, near Yarmouth. James Thurtell had accepted a challenge, a wager of 20 pounds, that a pair of his bullocks of "the native Norfolk breed" would "plough 12 acres in 12 successive journeys of 5 hours each." The trial began on Monday, June 8th, and ended on Saturday, 13th. The judges reported that 14 acres, 2 roods, 22 poles— $3\frac{1}{2}$ furrows to each yard, except 6 furrows, 7 inches deep were "ploughed clean, and in a husbandry manner." This James Thurtell had bred, and, in 1810, had slaughtered a "homebred" of 103 st. $6\frac{1}{2}$ lbs.: the hide and head weighed 7 st. 8 lbs. A month earlier another "homebred, bred at Ormesby, gave as carcase weight 150 st. 5 lbs. (14 lbs. to the stone): quarters 116 st., loose fat 19 st. 13 lbs., hide 10 st. 3 lbs., head 12 st. 10 lbs., tongue 12 lbs.: the best bullock ever bred and grazed in Norfolk, and not five years old" (*Norwich Mercury*, June 19th, 1810). Thurtell at the dinner spoke to Mr. Coke and his guests of the worth of the "Norfolk breed," of which "he had many years full knowledge." Doubtless there were others with whom John Reeve talked ere he resolved to buy a number of polled homebreds, of which as we have mentioned there was in the autumn of 1804 an ample choice within a few miles of Wighton. When the new lease was resolved on he would appear to have secured the service of a blood-red Norfolk "homebred" bull with which to mate his dairy cows. These we may guess were the facts; no record exists that was known to Richard England, his grandson. (This Mr. England was the third of the name to own and cultivate the wealthy, well-watered Binham "Abbey Farm," an area that from the close of the 11th century was owned by a few Benedictine monks. The west front of their beautiful priory yet stands. To him I owe my earliest knowledge of the beauties and points of the Red Polled of today, and the speedily formed resolve to establish a Herd Book).

HYBRIDISATION

The first well-grounded result of John Reeve's experiment in hybridisation that has come down is that on July 1st, 1808, he met

his fellow members of the East Norfolk Agricultural Society at Swaffham, and showed them a bull of his own breeding. In the advertised official report of the awards we read:—

The stock shown was not numerous, but excellent of its kind. The premiums adjudged were . . . for the bull (one only being shown) to Mr. J. Reeve, of Wighton. This breed is a new kind, partaking of the best qualities of the Suffolk and Devon and the old Norfolk. It has no horns, is of a true Devon or Norfolk red, and will get stock that will fatten to about 50 or 60 stone, with as little coarse meats as can be expected.

A further development was evidenced at the Holkham Sheep Shearing in June, 1810, when the choicest stock of landlord and tenants were shown. The county newspapers reported as follows:—

Mr. Reeve showed his Norfolk bull and two-year-old heifers, which convinced every person who saw them to what a height of perfection breeding may be carried on by care in selection. Mr. Reeve's Norfolk bull was greatly admired as an animal of very superior bone and points, and his heifers are such as few men can exhibit.

Mr. Reeve, of Wighton, showed a real Norfolk bull, four years old, "a noble beast," of his own breeding, being a short, compact animal, small in bone and great in bulk, of the Devonshire color.

It may be supposed that subsequently Mr. Coke and Mr. Reeve had a talk as to the worth of "the new breed," and especially of the heifers as producers of prime "homebred" beef. The end of it was a challenge to Reeve to show one of his heifers against a Holkham-bred Devon heifer; the premium, a money wager. Accordingly, after the Thurtell incident, above noted, the company went to inspect Mr. Coke's five-year-old Devon and Mr. Reeve's three-year-old Norfolk homebred. A large number put down their money to support their estimate of the carcass weight of the Devon. On Wednesday the first business was to see the carcasses of the two heifers. The reporters give the names of two persons who estimated the exact weight of the Devon carcass, but never a word of the more interesting detail: "Who won the wager?" The American Minister, Mr. Russell, who was one of the guests, may have written home this detail of his Norfolk holiday, but he could not have anticipated that the "Norfolk red polled homebred" was, just a century later to have thousands of representatives in the United States. Our present day interest is in the record of those carcass weights which may be compared with the weight of similarly bred animals of today. The newspapers give these figures:—

DEVON 5-year-old.

	st.	lbs.
Forequarter	14	3
Forequarter	14	8
Hindquarter	13	10
Hindquarter	13	12
	56	5
Tallow 8 st. 11 lbs.		

NORFOLK 3-year-old.

	st.	lbs.
Forequarter	13	5
Forequarter	12	11
Hindquarter	11	12
Hindquarter	11	12
	49	12
Tallow 8 st.		

14 lbs. to the stone.

Dr. Rigby, a Norwich physician, in a pamphlet on farm economics, states that he, as one of a large party of guests, was taken by Mr. Coke, in July, 1818, to see at Wighton, a herd of Devons and on the adjoining farm Mr. Reeve's cattle, "bred from Norfolk stock with probably a cross from the Suffolk: they are very fine."

Though the first trial at hybridising gave to all appearance the results that had been sought, there came with the following generations abundant occasion for judgment in selection. Reeve's skill was made plain in September, 1828, when his farming days were ending. There was issued the general invitation in these terms:—

Sale of Mr. Reeve's stock, at Wheycurd Hall Farm, Wighton—Eleven matchless blood-red cows in calf, two three-year-old heifers in calf, eleven two-year-old heifers in calf, and a two-year-old blood-red bull, one of the most perfect animals in the Kingdom.

In the work of breeding and selection Reeve had from the year 1810 the aid of the Hudsons (fellow tenants), and of Mr. G. B. George, farming at Eaton, on the Norwich county border, whose stock in 1822 were so many that he sold by auction twelve blood-red polled cows and a year-old blood-red polled bull. Richard England, John Reeve's aider, had by 1817 bought the Binham Abbey Farm, and his son Richard then occupied it. Soon after, this young farmer married Reeve's daughter, and thenceforward joined in the breeding and selection of the stock until 1844—some time after Reeve's death. His son Richard recalled in June, 1873, the memory of "thirty cows of a beautiful red. I doubt if there are any better at the present time." That the Reeve stock were used by a number of breeders from 1813 on their old style polled "homebred," and that his son John bred them at Walsingham would seem to be the fact.

The County Societies, however, ignored them till 1846, providing classes for Devons, Shorthorns, and Herefords, while Ayrshires were brought in as dairy cattle. A fair number of Suffolk men were more liberal in their support, but so late as January, 1862, others would be content even with a cross-bred if only it was polled and born in Suffolk. Fortunately, the Council of the R. A. S. E. ended this bit of localism by requiring for the 1862 show, to be held in what is now Battersea Park, London, that the cattle, which had in previous years been competitors in the "Any Other Breed" classes, should be exhibited as "Norfolk and Suffolk Red Polled."

Continuous progress was delayed by the outbreak of rinderpest in 1866-77. Well-bred herds fell victims, and but for the selection in the year 1864, by Benjamin Brown, a small Thursford farmer, there would have been no certainty that any of the Reeve stock yet existed.

THE GROUNDWORK

The lovers of the "Red Polled"—under which title the Herd Book was issued when the cattle had won a place in the United States—have to thank a few men on each side of the Atlantic for their enthusiasm in making good the damage that has been sustained by the "new breed;" and yet others for their care in recording the results by which to demonstrate what heredity has done for it.

When my offer to prepare a Herd Book was accepted by breeders in the N. A. A. Showyard, in June, 1873, no Standard Description was available. A small company met in Norwich and drafted what was needed. They were not very hopeful of success, since they knew that very few records had been kept. Newspaper duties leaving Saturdays available, I visited many of the breeders, and week by week gave the public the information thus acquired. Interest was aroused. This led to the Rev. George Gilbert, Vicar of Claxton, near Norwich, one of the few amateurs who had mastered Shorthorn pedigrees, and whom "The Field" accordingly retained for its cattle department, to call on me. Being of a very old Norfolk family, to whom stock and breeding was a pleasure, he offered his aid. We examined all available Herd Books, and were agreed that most of them were wanting in definiteness. In view of what my personal enquiries and notes made available, Mr. Gilbert suggested the grouping of cows into families, arranging the groups under Place or Personal Names, each Foundation Cow in a Group having a number added to the Group letter as its ancestress of a Family.

It follows that the lineal descent, whether of dam or the bull with which it was mated, is seen at a glance. Given the Register No. and the Group letter with its attendant number, and the searcher for facts has his path clear. In the second part of the Foundation Volume of the Herd Book, a Register No. was set down before the name of every cow, that of the bull following the name. Later the pedigree was so printed as to show the descent to the third generation and the statement of the number of generations recorded from the Foundation Cow. The name and register number of sire and its sire are also seen in each pedigree. By this plan present-day breeders group their cattle in the Herd List. The groups now represented are:—

A. Elmham, B. Biddell, C. Cranmer, D. Cley, E. Eaton, F. Easton, H. Hammond, I. Hudson, K. Kimberley, L. Mileham, M. Marham, N. Necton, O. Oakley, and Thornham, P. Powell, Q. Stalham, R. Starston, S. Stoke, T. Thursford, U. West Suffolk, V. East Suffolk, W. Wolton, X. Trimley, 1 Norf. Pond, 2 Norf. Mann, 5 Norf. Ransom, 7 Norf. Hill, 1 Suff. Baker, 2 Suff. Boon, 4 Suff. Lock, 5 Suff. Mumford, 6 Suff. Sheppard, 7 Suff. Wilson, 9 Suff. Wolton.

For the study of the heredity of the Red Polled, as evidenced by its milk production and its beef production, I have prepared the extended pedigree of each of 29 cows bred in the United Kingdom, and of 11 in the United States. These are for the most part in chronological order, so as to show where pedigrees coalesce. Further, I have assumed as fact, that for a very long time, the polled "home-bred" of Norfolk was separate from the polled Suffolk, while all the Red Polled since 1873 have had an infusion of the Reeve blood-red breed. The proportion of each of these three elements in each of the several cows and bulls named in the extended pedigrees has been worked out. In a few cases the total is 1,000: in all the others 999.9 and a fraction. The stock whose breeding could not be even guessed at, save that it was pure, have been counted as N. 1,000 for Norfolk; S. 1,000 for Suffolk; RP. 800, for the Reeve hybridisation. The exceptions may be thus set down:—Elmham, A. (Home Farm), from 1854, N. 800, S. 200; Powell P., from 1845 to 1870, N. 200, R. P. 800; Eaton, E., to the year 1850, N. 300, R. P. 700; after 1850, N. 300, S. 200, RP. 500; Hudson, I., N. 750, RP. 250; Oakley and Thornham, O., S. 800, RP. 200; Starston, R1, N. 300, S. 500, RP. 200; Glemham, V 8—14, N. 600, S. 400. Some cows to be seen in 1873-4 appeared to have a goodly proportion of R. P. blood, but in the absence of recorded facts they have been set down as 1,000.

Facts and figures are here presented to show heredity and milk production. Then follow details of the breeding of the more noteworthy bulls which have been mated with the cows, so as to suggest to students of heredity possible grounds for an increased return of milk, or for an increase of the live weight and the dressed carcase of the Red Polled dual purpose cattle; with the no less important consideration of the cost of feeding for milk and beef respectively.

MILK RECORDS

There have been published 2,150 records of milk production since May 1st, 1886. The rule of the Herd Book being "all or none," every cow which came into full profit had to appear in the Herd Records sent for publication year by year. In the United States, since December, 1908, there has been a system of "Advanced Registry," based on the monthly return to the secretary for a term of 365 days, with inspection by persons appointed by the Board of Directors.

The daily record of milk production of a whole herd was a very rare thing in 1880, when Mr. R. Harvey Mason, who had then come into possession of the Necton Hall Estate, began the practice. He

had made his selection of Neeton-bred Red Polled cattle at the public auction in the previous October. When I prepared for Messrs Cassell & Co. (Ltd.) an article on "Red Polled for the Stall and the Dairy," to appear in the "Live Stock Journal Almanac" of 1883, Mr. Mason kindly furnished me with precise details of milk production. Being at Bale, to choose from Mr. John Hammond's well-known "Davy" family a heifer, for the group of 10 heifers which I was in July, 1882, asked by Col. J. B. Mead and Mr. Robert J. Kimball to select for their farm in Vermont, Mr. Hammond, who was a veterinary surgeon as well as a farmer, kindly met my request to record the milk yield of 1451 Davy 27th—H1. The cow which had produced her second calf, on August 16th, had such an escutcheon as the Guenon theory held to be the sign of a good milk yielder. The record was made to April 30th, 1883, when, by Messrs. Cassell & Co.'s permission, I was preparing the "Almanac" article for re-issue in the second volume of the Herd Book. A monthly summary of the yield of four cows in the Diddlington herd from September 1st, 1882, to May 21st, 1883, was also kindly made for me. These last were of the families B 9, B 10, B 20, and V 2. In this way I was enabled to give the public milk records which were evidence of heredity then well-nigh unparalleled. (My American readers will find these records, with well-nigh all my reprinted articles, and also a re-production of the beautiful wood-cut of a group of Red Polls drawn from three separate photographs for the L. S. J. Almanac, contributed by one with whom I had no communication direct or indirect, and put forth by him as original, in the "United States Consular Reports: Cattle and Dairy Farming," issued in 1888). Further, it is well to note that in the "Live Stock Journal," annually from May, 1887, milk records of whole Red Polled herds were published; that in 1887 a similar record of the Whitlingham Herd—prepared by me at Mr. Garrett Taylor's request—was circulated among the members of the "British Dairy Farmers' Association," then visiting Norwich; and that from June, 1890, the publication of "whole herd" Milk Records was authorized by the Red Polled Society, which had been established in April 1888. Yet a Scotch authority on Milk Records asserts that "the present system of taking milk records originated in Vejen, a small parish in that part of Denmark known as Jutland . . . in the beginning of the year 1895," and that it was also begun in Holland and in Sweden in 1897. It is a matter of fact which anybody may see in Vol. XIII of the Red Polled Herd Book (Vol. VIII of the American edition) that in the year 1895 there were 13 whole herd milk Red Polled records (320 cows) laid before the public, all well authenticated. I can personally vouch for the truth of the Whitlingham record of the 126 cows for that year. I regularly inspected the milking from time to time, was supplied with the weekly and monthly sheets; calculated the total returns, and made full notes with grass feed results, for an annual issue by Mr. Taylor, on milk yield totals and inheritance, year by year, from 1887 to the spring of 1904. It may perhaps, be granted that my voluntary work of the kind was equal to that of a paid official, who probably has had fewer opportunities of acquiring knowledge.

PROGRESSIVE MILK INHERITANCE

The foundation of A1 Family in the Elmham Group was 427 Primrose. She was in the herd when, in the fifties, Mr. Thomas Fulcher was appointed Estate Agent, with direction of the home farms. He found Live Stock Account Books from the year 1849.

The herd was then one Polled bull, ten Polled cows, and 36 head of young stock. Primrose was set down as a young heifer. She was bred regularly to June, 1874, had a good name as a milker, and in May, 1875, though then 26 years old, she may have added yet further to the herd, but fell into a water hole and was drowned. From three of her progeny, bought at Elmham sales, were descended the 40 cows whose milk records have been published. (To economize space the number of days recorded is printed within parentheses).

Mr. T. Brown, founding a herd at Marham, bought 332 Marguerite, whose sire was a Royal Eaton-bred bull. Her gr.-dr. 329 Maggie gave birth to two cows, each by a P3 bull: 2382 Mistleto, 3d c., 7,021 lb. (288), 7,310 lb. (284); and 3002 Modesty, 7,259 3/4 lb. (407), 7,617 1/4 lb. (330), 5th c., 12,258 1/4 lb. (584). Mistleto's Breed Analysis: N. 476.56, S. 79.68. RP. 443.75: Modesty's N. 553.90, S. 78.12, RP. 67.96.

At Elmham sale Mr. Robert Loftt, of Troston, bought 195 Elmham Rosebud, 4-yr.-old progeny of 468 Rose, whose dam, 427. By a Troston-bred bull he added to his herd 872 Elmham Rosebud 2d. Mr. J. J. Colman also bought at Elmham the 1st calf of 195—196 Rosebud 2d. From 195 there thus resulted two strains of diverse blood, which at Whitlingham made milk records.

1031 Moss Rose, the progeny of 196 by Powell 143, bred 1934 White Spot, and she in two succeeding years gave birth to 2488 Red Spot and 2765 Dot. 2488's best returns were 6,575 lb. (302), 7,642 lb. (343): Dot's-2d c.-9,345 lb. (360), and after 14 days—her last calf —5,067 1/2 lb. (307). When 20 years had passed her Amrecian-bred progeny, tracing to 3993 Dorothy, added to Dot's record. Red Spot covered by Iago 1025-O9, produced 9223 Spot 3d. Breed-Analysis: N. 441.40, S. 83.97, RP. 474.60. Mr. Garrett Taylor assented to his experienced herdsman, Fox, selecting heifers, which had dropped a first calf, to be milked as long as they would yield freely and delay service. The problem was: Will such a fostering of the milk tendency influence the milk inheritance? Several bits of evidence may be found in these records. 8223 Spot 3d was one of the early selection. She was in milk 422 days; yield 7,824 1/2 lb. After 16 days-2d c.-and in the following 35 days gave 1,065 lb., in the year's yield 6,348 1/2 lb. (342), butter fat 3.7: her total yield 45,521 3/4 lb. (2,501). 8223's 12959 Shalot, 15,437 lb. (815); 17687 Spot 3d—1st c. on Oct. 1st, 1902—record from Novemher 13th, '02, to December 31st, '03, 6,096 1/2 lb. (415).

The Troston-bred 6330 Elmham Rosebud 4th (with two instalments of N 2 blood)—116 days after 1st c. began her record at Whitlingham: 5,088 lb. (346), fat 4.6. In following years: 6,273 lb. (350), 9,023 lb. (365), 6,536 lb. (336), fat 4.9; 10,038 1/2 lb. (354), 8,222 3/4 lb. (364), 6,920 1/4 lb. (320); 9th c. 5,480 lb. (287); total, 57,500 3/4 lb. (2,688). Breed Analysis: N. 409.37, S. 565.71, RP. 24.89. From her dam, with U43 and I9 inheritance, was 7082 Elmham Rosebud 9th-3d c.-10,159 lb. (322), 9,262 lb. (308), 10,368 lb. (321), 9,647 lb. (230). 7082's 13250 Brentwood Bud (by a V1 sire)-1st c.-6,883 lb. (301), 6,534 lb. (307), 9,278 lb. (318). 13250's 21071 Brookshall Bud 2d, record 7,159 lb., and in the two following years 21,089 lb. 13250's 21589 Brookshall Violet-2d c.-8,193 lb.

Dot's 3993 Dorothy—A1 (by Falstaff 303, which served both in Norfolk and America)—when covered by Corporal 4313-T1 gave [18100] Daisy and [24886] Darling—(square brackets distinguish American registration after December, 1900, from British registra-

tion, Darling, in 1909, on test 7,374 lb. fat, 281.46; Daisy, served by Marmon 5674, produced [26377] Diana, and, by Jonah [11778], [26378] Diana 2d. Diana's tests gave 7,439 lb., fat 285.77; 6,477 lb., fat 240.86; 6793.1 lb., fat 238.88; 9276.6 lb., fat 340.26. Diana 2d's tests: 7082.6 lb., fat 316.58; 7,439 lb., fat 305.19; 9132.7 lb., fat 398.34; 10,719 lb., fat 469; 12620.1 lb., fat 546.89. Dot's Breed Analysis: N. 377.34, S. 44.91, RP. 577.73. Dorothy's: N. 554.29, S. 43.54, RP. 402.14. Diana 2d has a larger proportion of Suffolk inheritance through her V9 sire: N. 512.24, S. 158.44, RP. 329.23. Diana gave three of her progeny to the test—all got by Proctor Knott [12092]—E11, son of Corporal 4313. [30177] J. D. L. Daisy's 6035.7 lb., fat 225.18. [31786] J. D. L. Daisy 2d's, 5468.5 lb., fat 208.7. [35788] J. D. L. Dot's, as a 2-yr.-old, 8478.2 lb., fat 389.27. Diana 2d's get; [30176] J. D. L. Diana 3d, 5584.4 lb., fat 221.77 (311); and [31787] J. D. L. Dorothy, 5348.9 lb., fat 253.11; 8523.8 lb., fat 428.57; 11614.8 lb., fat 571.46 lb.

Record of other progeny of 468 Rose—A 1, besides those of 195—A1, is: 8667 Primula 3d—(from 30 days after birth of 6th calf)—9,613 lb. (350), 7,622½ lb. (322), 9,245 lb. (310).

The third set of 427 Primrose records is through 371 Nelly, which entered Mr. W. Bradfield's herd. He used in succession The Palmer 138, its son Rufus 188, and an Eaton bull. Then a B4 bull, whose blood was almost wholly Suffolk, was used by a new owner of the stock, and the result, 6962 Bower Blush A1. She was bought as the beginner of Mr. C. F. Newton's small, now also noteworthy, herd, at Saham Toney.

6962's earliest annual yields were 7,694 lb. (358), 8233.34 lb. (327); her total 44,270½ lb. (2,083). Of Bower Blush's progeny: 11539 Meadow Sweet's record was 52,985½ lb. (2,697); 12619 Meadow Blush 2d—a year younger than 11539, and got by Jupiter 4475—N6 began her record with 5,518 lb. (228), and in succeeding years it ranged from 6,950 lb. to 9,510½ lb.; total yield from 17th May, 1899, to 6th January, 1911, when she was sold, 91,508¾ lb. (4,156), fat 4.0 to 4.6. 6952's 17009 Little Blush's 4th c.-8,154 lb., fat 3.9 (339); total 27,-238½ lb. (1,183). Also of 12619's progeny, 17126 Meadow Blush 3d by Lord Kitchener 7316—2 Norf. She began with 7799¾ lb., fat 4.4 (350); the 12 records to 30th September 1915, are: 8,002½ lb., fat 5.1 (365); 9,881 lb. (322), 9,336 lb. (330), 9,018 lb. (329), 9,509 lb. (319), 10,370 (353), 8,364 lb. (355), 8,908 lb. (354), 9,754½ lb. (354), 10,380 lb. (365), 9,773 lb. (329); 9,387 lb. (330). After giving birth to 2d c., June 8th, 1903, 17126 was in milk 615 days, and 3d c. was born January 6th, 1905. Breed Analysis of 17126: N. 684.88, S. 142.60, RP. 172.51; of Bower Blush, N. 398.03, S. 435.34, RP. 166.62. Of the 17126's daughters, the records were 18720 Maf's Blush 1st c.-6,521½ lb., fat 4.6 (341); 21,729 Meadow Blush 5th-1st c.-8,060 lb., fat 4.7 (325).

The Families A3, 4, and 5 were founded on cows bought in 1854 from Mr. John Palmer's old herd at Brettenham, and akin to K18 and 19. It is probable that the inheritance was a combination of Norfolk, West Suffolk, and the Reeve "Red Polled." The A3 records were made at Aspall Hall by Mr. J. B. Chevallier: 12986 Snowball's 8,223 lb., 8,199 lb.; total 17,845½ lb. 12986's 18771 New Snowball 1st c.-6,138 lb.; then 2-yr av., 6,197 lb.

The 28 records of A4 cows began with 2669 Carlista-2d c.-8,603½ lb. (267). 6267 Cosy was got by a son of Iago 1025 out of a daughter of 2669. Record 1st-c.-4645¾ lb. fat 5.2 (301). In 11 years she gave birth to 12 calves. Total yield, 72,374 lb. (3,336); highest rec-

ord, 8,657 $\frac{1}{4}$ lb. (294). Breed Analysis: N. 428.71, S. 68.16, RP. 503.12 6267's 10116 Cosy 3d, total, 31,029 $\frac{1}{2}$ lb. (1518); 4807 Carlista 2d—by Iago 1025-1st c.-6,446 $\frac{3}{4}$ lb. (321); 10-yr. av., 7,726 lb. (3,100); highest record, 10,086 lb., fat 5.2 (301). 14712 Cono-1st c. gave 11,486 $\frac{1}{2}$ lb. July 11th, 1901, to October 29th, 1903, 833 days, and before her sale in March, 1904, had-2d c.-given 2,025 lb. (77). At the 1916 R. A. S. E. Show, 21925 Russet's Belle 2d won first prize for 56.37 lb. milk, fat 14.60.

6199 Blossom 5th, the first A5 record-1st c.-9912 $\frac{3}{4}$ lb. (457); highest records, 10,024 $\frac{1}{2}$ lb. (350), 10,247 lb., fat 4.4 (364); 7-yr. av., 8638.89 lb. 6199's 16190 Berlin-1st c.-8,755 $\frac{1}{4}$ lb. (457). 7687 Bertie, produce of 6198 Blossom 4th-1st c.-8,213 $\frac{1}{4}$ lb., fat 4.1 (414).

The Families A6 to A29 were bred by Elmham tenants. 9067 Nanfred—A6, 6-yr. av., 7399.68 lb.; 21277 Nettie—A6, 3 calves and 24,444 $\frac{1}{2}$ lb. yield; highest record, 8,724 $\frac{1}{2}$ lb. The earliest A11 records that of 2805 Felicity, when 12-yr.-old, was 9,069 lb. (280), and 9352 Foliage, from the same dam, 7,812 lb. (349). 7712 Bower Branchlet—A11, after 2d c., 8,341 $\frac{1}{2}$ lb. (449), 3d and 4th c., 21,809 $\frac{1}{2}$ lb. (931), and in the two following years, 14,615 lb. (522). 18182 My Lassie, a gr.-dr. of 7712, gave a 3-yr. av., 6642.1 lb.

In 1872 Mr. Fulcher sent Elmham stock to Mr. G. F. Faber, in New York State, a bull calf, two heifers in-calf, and 401 Ocean Maid—A12, a yearling. This first lot of the dual-purpose Red Polled for breeding in the United States was supplemented in 1874 by three heifers. These seven and their progeny, bred at the Ravine Wood Farm, were, until 1882, the only pure-bred representatives of the new breed in America. Ocean Maid was bred by a small farmer tenant, who held to the practice in vogue for more than a century—the “folding” of his three cows on turnips, so that the stock was very hardy, and had a heavy coat. Ocean Maid's 2d c., 1015 May, in 1884, gave birth to 2965 Mayflower, which was sold to Captain V. T. Hills, Delaware, Ohio. He, in 1892, bred from her, by Melton Chief 2424, 8025 Mayflower 2d, which won a most noteworthy position in the records of milk production. The programme of the Pan-American Exposition, at Buffalo, New York, in 1901, provided for a Model Dairy with a test of breeds of cattle, to extend from May 1st to October 31st. The American Red Polled Cattle Club resolved to do its part in the test, but cows due to calve in April were not available. Captain Hills, however, undertook to send five cows. It must be said that a more haphazard lot for so important a test cannot be imagined. One of the cows was 13 years old, three 8 years, and one 6, and they had calved down from 42 to 70 days when the test began. Yet their record for milk, butter, and increase of live weight, ranked the Red Polled Cattle fifth. It is a singular fact that a copy of the Official Report, which would give the details for each cow of the ten contesting breeds is not available in England, and the whole instructive business was well-nigh ignored by British agriculturists and dairy-men. 8025 Mayflower 2d, in the particular of individual records of net butter profit, came second to a Guernsey, whose record was 59.41 dollars. Mayflower's was 52.10. The net butter profit of the best cow of the several other breeds was Jersey 50.24, Holstein 49.43, Ayrshire 46.07, Shorthorn 43.91, Polled Jersey 42.80, Brown Swiss 41.23, French Canadian 40.63, Dutch Belted 38.02 dollars. Mayflower's milk yield in the 184 days was 6,161 lb.; estimated butter 323 lb. The Red Polled were in charge of a herdsman who was not an expert in cattle feeding, whereas the other cows were in the care of experienced men. Mayflower 2d's Breed Analysis was: N. 556.14, S. 295.82, RP. 153.0

[31727] J. D. L. Marigold, whose granddam was 9552 Mayflower 3d, and was got by Proctor Knott, records were: 7103.7 lb., fat 295.88; 8562.4 lb., fat 337.08. Breed Analysis: N. 506.54, S. 154.48, RP. 338.93. [23496] Marigold, her dam, was sired by Corporal 4313. Record: 7590.7 lb., fat 321.23. Breed Analysis: N. 522.82, S. 213.86, RP. 263.27. 9552's [17915] April May's records: 7096.9 lb., fat 249.52; 6817.4 lb., fat 225.53. [22934] Lot, 5th in descent from 401 Ocean Maid through 1681 Mollie, gave 6527.5 lb., fat 276.32 (296).

18723 Marget—A13, bought in 1907 for the Earl of Radnor's herd at Longford Castle, near Salisbury, was sired by Red Knight 7539, 11-yr. av., 6976.6 lb. (3467), highest record 7,919 lb. (222). 18723's 21715 Longford Devote's record, 19588 lb. (756); highest, 9,380 lb. (350). American A13 records: [8067] Clara L. 7112.8 lb., fat 383.04. [20493] Spot, 10136.5 lb., fat 440.95. [25814] Audrey A., 6117.2 lb., fat 229.30. [20493]'s [28396] Spicy, 1,681 lb., fat 327.34.

12079 Brocade—A21, 3-yr. av., 6115.6 lb. 8686 Little Lass—A22-1st c.-5,083 $\frac{1}{4}$ lb., 6-yr. total record, 46,444 lb. (2,165); highest, 9,657 $\frac{1}{2}$ lb., fat 5.5. 9461 Kathleen—A24-1st c.-6,078 $\frac{3}{4}$ lb. (415); 4th c., 12,235 $\frac{3}{4}$ lb. (364); 5th c., 10,650 $\frac{1}{4}$ lb. (300); next three years ranging from 9,000 lb. (360) to 9,979 $\frac{1}{2}$ lb. (326). 15858 Selina—A24, 4-yr. av., 6200.5 lb. Her progeny, 19897 Majilini, 3-yr. av., 7,129 lb.; highest record, 8,570 lb. (329); and 20445 Majiselo, 4-yr. av., 7,155.25 lb. American A24 records: [30221] Beauty S., 5,777 lb., fat 2.3 (247); 8136.5 lb., fat 353.3 (334). Out of the same dam, [32011] Gazelle, 7029.5 lb., fat 297 (305); 8861.5 lb., fat 430.98. [25609] Pocket—A29 records 6047.1 lb., fat 204.46 (332); 8554.1 lb., fat 346.66 (348). 2568 Sybil 6th—A31, 5-yr. av., 7429.3 lb.; largest record, 9468 lb. (468).

A large proportion of the B Group had their origin at Playford, where was Mr. Arthur Biddell's herd. Mr. Herman Biddell asserted that records of breeding and tests were made in his herd and that of his brother, Mr. Manfred Biddell, but none were available. A study of the form of the cows evidenced that sires from Sir Edward Kerrison's herd at Oakley had been used on the High Suffolk type, and thus there had been an infusion of the Reeve "Red Polled" blood. It was also probable that the old Norfolk strain had been drawn from Mr. Moseley's herd, brought to Glenham Hall in 1823 from West Tofts. The Heid Book Register in 1874 had a record of a strong mixture of Norfolk blood, from 1869, through Seneca 195, from Mr. Henry Birkbeck's herd at Stoke Holy Cross. This was followed from 1874 by the use of Iron Duke 125, which had Powell blood for two generations following on two of the old Elmham strain. In 1882 Mr. A. J. Smith set up a Red Polled herd at Rendlesham, selecting 21 cows of the B Group, and a while after adding others. By the policy of making the best of his early selection, with systematic milk records from September, 1889, he won a reputation for the herd. The quoted records of the Group are few of the many published. The Rendlesham and Eyke mine of wealth was well worked while Mr. Smith lived, and only ended at the sale of the herd in September, 1913.

[18060] Christmas Bess—B4, 7802.50 lb., fat 266.55. 4234 Necklace—the get of Davyson 7th 476-B 5—made a 7-yr. av., 4323.97 lb. Her daughter, by Grand Duke 1388, son of 476, was 6594 Necklace Grand, 30,354 lb. (1,256), 4-yr. av., 7588.5 lb., highest record, 8,719 lb. (343). 6594's 11612 Necklace Grand 3d, 4-yr. av. 6592.25 lb., and 1205 Necklace Grand 4th, 6-yr. av. 6256.66 lb. 11612's in her turn 18187 Necklace Grand 7th-1st c.-6,997 (336), then 3-yr. av., 8,360 lb., 4234 also got 9611 Necklet, 4-yr. av., 5299.75 lb., and 13471 Eyke Neck-

lace 3-yr. av., 5657.3 lb. (959), while her gr.-dr. 22195 Nectrine had a 3-yr. av., 6,640 lb.

There are 63 records of B6; of four daughters of 3169 Sweet Pear and Monarch 4th 351, bought of Mr. H. Biddell in 1885 by Mr. Smith. 3100 Ripe Pear, 8-yr. av., 6647.7 lb.; 3628 Orange Pear, 3-yr. av., 6485.7 lb.; 3777 Sweet Orange Pear, 4-yr. av., 6388.2 lb.; 4393 Sweet Pear 2d, 7-yr. av., 6884.32 lb.; highest record, 8,493 lb. The best of 3100's progeny, 5181 Wonder Pear, 14-yr. av., 6162.8 lb.; total 86,280 $\frac{1}{4}$ lb.; and 6631 Pear Again-1st c.-5,884 lb., then 2-yr. av., 7,232 lb. Of 3628's 7274 Louise Bonne, 4-yr. av., 5293.6 lb. Of 4393's 9151 Billy's Pear, 10-yr. av., 6624.51 lb. 5181's 9066 Wanderess, 9-yr. av., 6443.5 lb. (2,992). Breed Analysis: N. 337.34, S. 449.88 RP. 172.76, varying little from that of 3011: N. 382.02, S. 485.35, RP. 182.61. Following on Wanderess' line, we have 17522 Rendlesham Wanda-1st c.-7,745 $\frac{1}{2}$ lb. (317), then 7,713 lb. (322); 6,440 lb. (269); and her twin sister—sire Comely Roger 3856—17523 Rendlesham Wanda 2d-after 2d c.- 18722 lb. (674), 20021 Rendlesham Gipsy, the last of the progeny of Wanderess-1st c.-7,005 lb. (322); 5-yr. av., 7271.1 lb. (1,725). Breed Analysis: N. 353.20, S. 451.92, RP. 194.84.

4393 Sweet Pear 2d-1st c., 6857 Wholly-a-Pear, 5-yr. av., 5544.54 lb. 6887's 13472 Eyke Pear, 10-yr. av., 6763.8 lb. 13472's 3d c. 18200 New Pear 1st c.-6,047 lb. (308); 6-yr. av., 6095.7 lb.

Third in descent from 3628 Orange Pear, 19454 Rendlesham Lucy, 7-yr. av., 8712.5 lb. 11764 Rendlesham Pear, progeny of 6631 Pear Again, 5-yr. av., 7132.2 lb., and its 17520 Rendlesham Pearmain-1st c.-6,528 $\frac{1}{2}$ lb. (271), followed by 7-yr. av., 8,540 lb. (2,083). 17520's 25024 Rendlesham Pear Blossom during a 5-yr. yield, gave 8,595 $\frac{1}{2}$ lb. (330), 9124 lb. (295), 9,334 $\frac{1}{2}$ lb. (283), and in Lord Radnor's herd 9,036 lb. (266). 17520's 21362 Rendlesham Sweet Pear-3d c.-10867 lb. (684). 21830 Rendlesham Main Pear in 2 years gave 3 calves and 13,388 $\frac{1}{2}$ lb. (652). 21290 Sudbourne Buerre 3d won second prize at the 1914 R. A. S. E. Show, for milk 56.37 lbs., fat 12.40; and that of 1915 for 63.37 lbs. milk, fat 13.28. 20021's 21353 [30851] Rendlesham Nomad on test 6716.2 lb., fat 357.67.

10259 Firefly—B8-1st c.-5423 lb.; 3d c., 9813 lb., was so uneven a yielder that her 8-yr. av. was 6,188 lb. Her 11255 Fly, 8-yr. av., 7761.1 lb. [20619] Nancy 8502.5 lb., fat 362.17. The only record of B7 was [23509] Dolly, 7960.75 lb., fat 347.14. 5096 Rosamond 2d—B9, 7-yr. av., 6749.7 lb. Her 15731 Rendlesham Rosamond, with a prolonged 3d c. yield, followed by twins, gave a 4-yr. av. 6374.37 lb. 8035 Old Lowestoft—B9 whose 6th c. yield was 6058 lb. (291), by her 11474 Lowland Lassie-1st c.-6,420 lb. (277), gave-5th and 6th c.-13,636 lb. (447), and her 18404 Woodland Lassie-2d c.-7,525 lb. (227). Of B10 only American records are worth noting: 11298 Gold Drop, 11,889 lb., fat 510.62, and her [18099] Cresco Goldie, 8,755 lb., fat 370.81. [26428] Goldred got by six generations of Norfolk blood, 9,188 lb., fat 336.28.

Of the B11 Family there are 111 records, made during 20 years. Of the many cows and heifers of this family in the Smith selection the following are noteworthy:—2010 Belle, whose best of 3-yr. yield was 6,840 lb. 2175 Eyke Duchess 10th-11th and 12th calves-21,160 lb. 3954 Countess of Eyke 3d, 6-yr. av., 4578.4 lb.; and 2177 Eyke Lassie (15 calves), 4-yr. av., 4371.3 lb.

2177's 3200 Village Lassie by 351—Q1 3-yr. av., 6866.4 lb., and her gr.-dr., 6110 Wild Lady, 4-yr. av., 7833.25 lb. (1,279). 6100's 9075 Wild Lass-4th c.-8,096 lb. (357). Village Lassie, in her last year, produced, by Starston Hero 2083—K19, 7748 Chicago Lassie, 6-yr.

av., 7118.7 lb. (1925). 7748's 10095 Chicago Maid, 7-yr. av., 7,865 lb.; 13295 Chicago Lass-1st c.-4,882½ lb. (286), 8-yr. av., 7018.7 lb.; 16347 Chicago Girl, 2-yr. av., 8081.5 lb. (554); and 17905 Chicago Maiden-1st c.-7,178 lb. (290). 10095's 18459 Belle of Chicago-1st c.-5,246 lb. (298), then 5-yr. av., 6,087 lb. (1,719); her 26076 Rendlesham Chicago, 5-yr. av., 7,608 lb. (1,348), and 20521 Rendlesham Chicane's, with 2 calves, 12,150½ lb. (630). 13295's 17954 Chicago Gem, in 2d yr., 8,193 lb. (365), and her twin sister, 17955 Chicago Jewel, 6,225 lb. (356). 20446 Melton Majivi, third generation from 6110 Wild Lady, 4-yr. av., 7638.33 lb. (1,410), followed by 10,618 lb. (354) and 10,251 (334). 7625 Wilful (another of Village Lassie's gr. drs.), after 1st c., 9,077 lb. (514). Her 9677 Wilful 2d, 8-yr. av., 7115.1 lb. (2,551). 9677's 21005 Winsome, 7-yr. av., 7730.1 lb. (2,255), and her 22173 Longford Fairy, in the years 1913-15, 6,791 lb. (273), 9,472 lb. (339), 10,328 lb. (364). Village Lassie's Breed Analysis: N. 457, S. 410.34, RP. 13260. Wilful 2d's: N. 374.90, S. 428.67, RP. 196.39.

The 2010 Belle progeny began to make its mark with 3876 Beta-1st c.-8,285 lb.; 3d c., 10,247¾ lb. (322); 4-yr. av., 7893.6 lb.; and 6907 Beatrice-1st c.-5,566 lb. (308). 6907's 18442 Beatrice 2d, 5-yr. av., 8301.6 lb. (1790); highest record, 9,686 lb. (364). 6402 Grand Belle (gr.-dr. of 2010), 7-yr. av., 6789.88 lb. 6402's 8302 Abbess, 4-yr. av., was 7570.25 lb. (994); her 13474 Fair Abbess, 7-yr. av., 5874.8 lb. (2294). 13474's 19448 Rendlesham Abbess-1st c.-5,109½ lb. (309), then 3-yr. av., 6697.66 lb. (900); and 21352 Rendlesham Lovely Abbess, 2-yr. av., 6924.5 lb. (635). 8302's 1715 Rendlesham Abigail, 8-yr. av., 7753.8 lb. (2,781); highest record, 10,080 lb. (358). 10176 Donna Barbara, 6-yr. av., 6742.3 lb. (2,086); the dam of 18603 Eyke Babs, 2-yr. av., 5,051 lb. (684), and gr.-dm. of 18327 Sudbourne Babs, which at 3-yr.-old made 4,602 lb. (194). 18327's 19617 Babs 2d 6-yr. av., 7,237 lb. 18327's 19502 Shameful-1st c.-5,703 lb. (204); a late 4-yr. av., 8,796 lb. (1234). 19502's 20682 Cheriton Shame-2d c.-6,994 lb. (336); 7th c., 7,610 lb. (306). 21324 Red Nun, with her dam 20017 Rendlesham Fair Abbess, was taken to Thornville, Co. Wexford, by Major Meadows, in 1908, a 5-yr. av., 6000.2 lb. (1,413); and in the year 1915, 7,273 lb. (365). 20017's 4-yr. av., 5189.5 lb. (1,225); her 22246 Red Nun 2d, 2-yr. av., 5064.5 lb. (594).

Of many other B11 records published, these are of recent date: 18327's 21025 Ashmoor Florence-5th c.-8,921½ lb. (344), 6-yr. av., 8,534 lb., and her 22417 Ashmoor Flo, 3 yr. av., 8077.3 lb.; 22416 Ashmoor Chic-Chic-4th c.-8,912 lb.

The earliest B12 record 2256 Honeywood was made at Whitlingham, 6-yr. av., 6,563 lb.; the highest, 7,950 lb. (449), fat 4.1. 2256's 5543 Honeycomb-1st c.-4,660 lb. (352). 7640 Anemone-5th c.-9,113 lb. (267); 2-yr. av., 8,526 lb. (505). Her 10932 Auburn, 2-yr. av., 8,150 lb. (610). 20032 Rendlesham Sunbeam-1st c.-6138, her 21360 [30853] Rendlesham Sundial 7985.13 lb., fat 213.63. 21973 Ashmoor Bessie, 3-yr. av., 7525.5 lb.

5026 Motherless—B13 had a 10-yr. av., 5354.75 lb.; highest yield, 5,953¾ lb. (288). 6630 Peach Girl, 7-yr. av., 7261.6 lb (2332). 8100 Peach Leaf 6th, 5 yr. av., 5612.4 lb. 7387 Peace, 3-yr av., 7687.33 lb. (964). Breed Analysis: N. 360.35, S. 415.86, RP. 223.77. 7387's 10606 Peaceful-1st c.-6592 lb. (269); 3d c., 9,291 lb. (287); 7th c., 11,428 lb. (328); 7-yr. av., 9,010 lb.; 10-yr. av., 8,644 lb.; her 17347 Pearl 1st and 2d c.-13404 lb. (798), followed by a 2-year av., 7,310 lb. (625). 6630's 10607 Peach-1st c.-6513 lb. (243), then a 2-year av., 7,283 lb. (679). 8100's 9963 Apricot-4th to 6th c.-av., 7,059 lb. (1,012), falling

off to 9th c. 6,425 lb. (317). Her 20527 Rendlesham Apricot, however, had a 4-yr. av., 7476.75 lb. (1286). 21325 Red Rag, a gr.-dr. of 9963, has at Thornville a 5-yr. av. 6482.4 lb. (1,668); record in 1915, 7,932 lb. (336).

22850 Sudbourne Minnie, which traces back to 5026 Motherless, had the distinction of being first of all the contending breeds at the London Dairy Show of 1914. When competing she had been in milk 19 days. Her two mornings' milk was 72.6 lb., fat 3.46, and the evenings' 64.6, fat 3.74: solids other than fat, 9.98 and 9.36. She won the Red Poll Society's prize, the Barham Challenge Cup as scoring the greatest number of points in the milking trials, 1,449, and also the Shirley Challenge Cup for giving the greatest weight of the milk in the trials. Her record for 1915 was 15,043½ lb.

4724 Stout Fruit—B18 led off that Family's records at Rendlesham-2d c.-8,447 lb. (294), 7,616 lb. (280), 9,514 lb. (360). Her sister (both were by 581—Q1), 5488 Fresh Fuss, 5-yr. av., 7371.5 lb.; her best record, 9,296½ lb. (350). 5488's 8553 Fresh Flora, 6-yr. av., 7185.2 lb. (1,906); and 10294 Fussy-3d c.-8,176 lb. (264). 8553's 13528 Fresh Flo, 3-yr. av., 7,533 lb. (968); 16337 Comely Flora, after 2d c., 15,442½ lb. (620); 3d c., 8,713½ lb. (365); and 20524 Rendlesham Florist-1st c.-7,518 lb. (298), then 6,273 lb. (332), 8,248½ lb. (333).

Of B20 there are 17 records at Rendlesham, 6 in America. 4152 Knockin 3d, from 5th c., 4-yr. av., 7035.6 lb. 6470 Knockin 7th, the progeny of the same dam, from 3d c., 7-yr. av., 7,471 lb. (2,347). 4152-1st c.-6050 Turn-in, 3-yr. av., 5,793 lb. 6470's 15723 Rendlesham Loo-1st c.-5,617 lb., then 8-yr. av., 8007.2 lb. (2,541); highest record-7th c.-11,024½ lb. (344); 15723's 21814 Rendlesham Bridge, 2-yr. av., 7025.5 lb. (779); and 22264 Rendlesham Lily-1st c.-7,021 lb. (301). 7275 Lovely (nearly allied to Knockin 7th)-1st c.-7,510 lb. (3,257); subsequent 3-yr. av., 7692.6 lb. (981). Lovely's 8862 Pretty, 4-yr. av., 7,757 lb. (944). American series: [19928] Lilian, 6,356 lb., fat 276.83 (282); 8,836 lb., fat 283.1 (317); 8,093 lb., fat 320.33 (304); 10,121 lb., fat 400.35. Lilian's [26746] Lillette, 8563.9 lb., fat 387.37; 5231.5 lb., fat 239.71 (246); 6019.9 lb., fat 262.7 (295); 6842.1 lb., fat 301.79; 10028.2 lb., fat 451.52; [27546] J. D. L. Lilian, 7308.3 lb., fat 261.15; 9,360 lb., fat 329; [31729] J. D. L. Latona, 11053.6 lb., fat 423.57; and [33552] J. D. L. Linnet, 7390.8 lb., fat 265.33. Lillette's [31728] Lillette 2d, 7615.5 lb., fat 284.90; 9813.2 lb. fat 442.11; 10891.9 lb., fat 492.29. J. D. L. Lilian's [31729] J. D. L. Lilian 2d, 5560.6 lb., fat 206.24; her [35757] J. D. L. Laura-1st c.-7897.2 lb., fat 331.56. Breed Analysis: 10429 Linnett, d. of [19928]; N. 371.85, S. 430.70, RP. 197.40. [19928] Lilian, N. 454.48, S. 266.78, RP. 27869. [34863] J. D. L. Latona, N. 472.37, S. 180.94, RP. 346.64.

The earliest of eleven B24 records 7065 Doll, gave, in 364 days of 1899-90, 10,624½ lbs. with, in 287 further days of 1890, 7,611 lb., and in 1902, 7,374½ (364). Her gr.-dr., 21322 Red Doll, best of 5-yr. records (these in Ireland), 5,131 lb. (259), 4,966 lb. (294). Red Doll's 22742 Red Doll 3d-1st c.-6907 lb. (351), 6,062 lb. (350), 6,408 lb. (336). 8522 Faithful, in 1901, 8th to 12th c., 5-yr. av., 8,602 lb. (1,415); thence to 15th c., 3-yr. av., 5795.66 lb. (798). 8522's 18881 Rendlesham Fay-1st c.-6,886 lb. (240), then 57,622 lb. (1,981); 4th c., 10,286½ lb. (349) 6th c., 11,414½ lb. (347); 7th c., 11,390½ lb. (320); total yield, 64,278 lb. (2,221). Breed Analysis: Faithful N. 79.43, S. 853.44 RP. 66.71; Rendlesham Fay N. 256.00, S. 517.66, RP. 226.30. Of 8522's

get also 15721 Rendlesham Faith, 4-yr. av., 6,176 lb. (1,299); and 20523 Rendlesham Faithless, 3-yr. av., 7,266 lb. (969). 18881's 22259 Rendlesham Fancy-2d c.-7,128½ lb. (344).

The E Group has some of its pedigrees from the year 1852, just forty years after G. B. George saw John Reeve's "new breed at Holkham, calculated its possible value, and became one of its realisers. He seems to have been the means, through Sir Edward Kerrison and other practical men, of improving the Norfolk and Suffolk Polled cattle to such a degree that just fifty-two years after a bull and two heifers were first exhibited they were a recognized breed. Mr. G. George, his elder son, had kept a register more than twenty years, but said little to enlighten the collector of pedigrees, when his brother, Mr. T. W. George, of Cringleford (lands near to Eaton), on retiring from farming in 1873, sold his Red Polled herd. The Herd Book, however, was supplied with the desired facts. G. George's 6-yr.-old cow, 412 Polly—E11, sold when he retired in 1876, has been the means of adding to the repute of the Red Poll in the United States.

4169 Linnet—E2-1st c.-4,561½ lb. (350), with 4th c. gave 6,578½ lb. (301). Her 5652 Linnet 2d (by Iago 1025)-1st c.-8,714½ lb. (658); then 5-yr. av., 7,072 lb. (1,582), fat 4.9. And 5652's 9518 the Linnet-1st c.-8,040½ lb. (693), fat 5.7. 9518's 11448 Lemon-1st c.-7,260 lb. (483), 2-yr. av., 6,796 lb. (631).

The E3 Family, transferred in 1889 to Mr. E. Smith Jameson, Mount Sterling, Kentucky, has only American records: [23497] Miss Matson-3d c.-6,651 lb., fat 27853; 7,063 lb. fat 301.37; 7744.5 lb., fat 328.92; 8923.9 lb., fat 400.54. [33551] J. D. L. Millie, 9413.7 lb., fat 372.74. [34870] J.D. L. Lady Watts-1st c.-10263.2 lb., fat 412.46.

5227 Belinda—E 5, in Lord Hastings' herd gave the first record-1st c.-5,097 lb. (264); 6-yr. av. 6,256 lb. (1,816). Her 9630 Olinda, 2-yr. av., 7,318.5 lb. (679).

The E11 records descended from 412 Polly, open with 3851 Annie Belle: 3-yr. av., from the 4th c., 6451.33 lb. (925). Her dam was 1985 Annie, whose 9th c. return was 4,909 lb. (320). 3464 Georgina, at Whittingham in 1889-91, recorded-3d c.-13,850 lb. (744), and her 6385 Georgina 2d-1st c.-5,051¾ lb. (438), fat 3.6; then 6-yr. av., 6,896 lb. (1,954). 14825 Donna-4th c.-10,761 lb. (343), 5th c., 10,104 lb. (322). 16723 Gold-drop, gr.-dr. of 6385, recorded-1st c.-8,051½ lb. (411); and 15884 Snowflake, bred from the E11's, ended that family's record at Whittingham with-1st c.-8,916 lb. (478). In Sir Walter Corbet's herd, from the same source, 19606 Acton Sweetbriar gave-2d c.-7,786½ lb. (358).

Breed Analyses: 412 Polly, N. 382.5, S. 300, RP. 337.5. 1738 Polly 2d sent in 1882 to Col. J. B. Mead and Mr. Robert J. Kimball, N. 439.06, S. 198.43, RP. 362.5. 8858 Portia, N. 449.99, S. 129.09, RP. 420.89. 10024 Biddy, N. 463.57, S. 80.21, RP. 456.2. 13205 Biddy 2d, N. 427.44, S. 216.5, RP. 356.03. Records: [26744] Princess Portia, 6536.2 lb., fat 268.84; 6626.8 lb., fat 246.33; 5640.6 lb., fat 222.57. Her [34866] J. D. L. Belmont, 9286.8 lb., fat 395.91.

E12 Family records have been regularly made at Heytesbury, Wilts. Lord Heytesbury founded a Red Polled herd there in 1893, which Margaret Lady Heytesbury has well maintained to the present time. All the records are from descendants of 5158 Susanna 5th. 15073 Heytesbury Frederica, 6,759 lb. (283). Her gr.-dr., 19822 Heytesbury Fredleaf 2d. 6-yr. av., 6581.3 lb. (1,720); highest record-7th c.-7,559 lb. (304). Her 21205 Heytesbury Pendant, 4-yr. av., 7,201 lb. (1,161);

21681 Heytesbury Passion 1st, 5,371 lb. (234); then 6,459 lb. (306), 6,306 lb. (257). Third in descent from 15073, 20397 Heytesbury-Susanna-1st c.-5,848 lb. (238), then 5-yr. av., 6,750.2 lb. (1,367); highest record, 7,448 lb. (273). Her 23052 Heytesbury Hanna-1st c. (in 1914)-5,584 lb. (235). 21202 Heytesbury Patience-1st c.-7,086 lb. (343); 22612 Heytesbury Susan 3d 1st c.-6,507 lb. (263); 2d c. 9,850 lb (365).

In another line of descent from 587 Susanna, 22625 Horton Peach has a record of (in 1912) 8,248 lb. (308); in 1914, 6,832 lb. (243). Her 22974 Cheriton Peach-2d c.-7,949½ lb. (298), fat 4.60. [34831] Saucy's Pride, 8178.5 lb., fat 313.79 (297).

The E13 Family got a strong foundation at Elmham through Davyson 3d 48 and Rufus 188, then passed into Mr. Hy. Birkbeck's herd at Stoke, and thence to Whitlingham, where 2159 Elizabeth opened the record-5th c.-6,702 lb. (350), 6 yr. av., 7,833 lb. (2136), fat 3.4 to 6.8. 2159's gr.-dr. 7842 Ethel 2d-1st c.-7542 lb. (444); and 7842's 11206 Ethel 3d-2d c.-6,826 lb. (427); 4th c., 8,792 lb. 16555 Ellen 3d, another of the Whitlingham E13's, 1st c. November 15th, 1902, recorded to December 31st, 2,954½ lb. (43), in 1903 6,682 lb. (365), and on March 31st, 1904, when her week's yield was 132¾ lb., had to her credit a total yield 11,509 lb. in 521 days. The sale catalogue credited her with a 1904 yield 5,566½ lb. and 2d calf.

Two Families of F Group are recorded: 6793 Success—F4, 7-yr. av., 5450.93 lb. (1,970). Her 17063 Magnolia 1st c.-5,465 lb. (280); then 7-yr. av., 6,665 lb. (1,892). 17063's 20443 Majimag-1st c.-8,013½ lb. (511), 20789 Melton Magnum-1st c.- 5445½ lb. (364), 21259 Melton Daisy-1st c.-8,101½ lb. (316); 2d c. 9,478 lb. (348), 21730 Melton Baroness, 3-yr. av., 7,788 lb. (899), and 22670 Melton Constance, from November 12th, 1912, 1st c., 8,985 lb. (415), milked to March 15th, 1914; on March 18th, 2d c., and the year's yield 6,624 lb. (363). 20443's 22675 Melton Ruby, 1st c. October 15th, 1913; 2d c. September 30th, 1914; milk yield the 434 days, 7,988½ lb.

Lord Heytesbury, at the starting of his herd, bought two F4 and two F6. There has been a re-registry, with Heytesbury added to the former names, and new numbers. (These are now quoted). 15092 Heytesbury Silk—F4-3d c.-6,878 lb. (313). Her 19831 Heytesbury Silk 3d, 7-yr. av., 6,777.14 lb. (1,905); highest record, 8,155 lb. (296); and 22,611 Heytesbury Satin-1st c.-with yield-2d c. from December 2d, 1913, 6,507 lb. (252), then 9,850 lb. (365).

The earliest F6 record 1737 Poll was at Whitlingham-6th to 9th c-4-yr. av., 7,078 lb. (1,169). 2961 Maud—the dr. of 1680 Moll, twin of 1737 Poll—was bought by Lord Heytesbury. Her 15078 Heytesbury Magnetic was dam of 15077 Heytesbury Magnet, 7,684 lb. (323), and 15084 Heytesbury Perennial, 6073 lb. (243). 15084's 19824 Heytesbury Perennial 2d, 3-yr. av., 6391.66 lb. (865), and 19823 Heytesbury Oak Apple-1st c.- 5,673 lb (309). 19824's 22608 Heytesbury Perennial 3d, 16719 lb. (287), 7847 lb. (298).

Mr. John Hammond's H1 and H2 Families have won many a prize in Royal and other competitions for beauty of form and high worth as beef cattle. Some 70 milk records may be found to evidence good value in the other condition; for which the dual-purpose cattle will yet be held to be the most satisfying of all needs in farm economics. Reference has been made in the note on Milk Records to the

daily yield of 1451 Davy 27th—H1 from August 20th, 1892, to April 30th, 1893. A brief analysis of the record may be of value for comparison not only with the Red Polled averages set forth in these pages, but also with records of the yield of other breeds, dairy as well as dual-purpose. On the 5th day of the record the yield was 42 pints; the 8th to 19th, 48—save two days, 44; to 26th, 52 to 56; the next 22 days, 48 to 40; 25 days of October, 38 to 36; November, 41 and 40; December, 5 days, 40; 26 days and on to January 24th, 39; then to March 28th, 38 to 33, 4 days, 26; and on to April 30th, 24 to 22. At the last named date the total was 9,349 pints (11,218.8 lb.) in 251 days, and she was then yielding 154 pints (192½ lb.) for the week. As Davy 27th gave birth to 2741 Davy 54th on August 5th, 1893, it calls for little guesswork to come to the conclusion that she would have increased her total to something like 10,000 pints (12,250 lb.). No other record is available from Bale, so there are wanting details to estimate how much of this result was due to environment. All the H1 cows bred there are registered as Davy with an appended number.

4851 Davy 87th, 4th in descent from 167 Davy 5th (which was dam of Davy 27th), 5th c., 8,714½ lb. (288); 9th c., 9,866 lb. (265); 6-yr. av., 7698.4 lb. (1,659). 6288 Davy 99th-3d c.- 10,881½ lb. (681). 2289 Lady Day, 2-yr. av., 6,683 lb. (682). Her 5773 Mrs. Gamp, 7-yr. av., 6,354.28 lb. (2210), and 5492 Galatea, 5 yr. av., 8079.4 lb. (1,636); highest record, 9,408 lb. 2289's gr.-dr. 8026 May Queen, 7-yr. av., 8378.57 lb. (2,141); highest records, 7th c., 10,144 lb. (322); 8th c., 9,861½ lb. (322). These records were made at Melton Constable, in the same area of Norfolk as Bale. Turning to a very different environment: 10849 Troston Davy 2d (on Lord Rothschild's estate), 3-yr. av., 6,083 lb. (914). Her 11899 Troston Davy 3d-1st c.- 7,623 lb. (327); 6-yr. av., 6690.8 lb. (1,975); highest record, 7,980 lb. (341). With her, 18736 Troston Davy 4th-1st c.-18,905 lb. (408), 2d c., 9,452 lb. (319). 13390's Davy Lass 2-yr. av., 5412.5 lb. (529). 19114 Daphne-1st c.-6,015 lb. (428); 2d c., 6,283 lb. (490). 20457 Molly Bawn's (bred in West Suffolk) 21032 Ashmoor Molly (removed to East Suffolk)-6th c.-6,241 lb. (332); 21978 Ashmoor Mary-1st c.- 6,491 lb. (354), and 22420 Ashmoor Margaret-2d c.-6666.2 lb. (336).

American Records: 15647 Princess 5th, 7065.8 lb., fat 231.39. 16457 Davy 213th, 9871.25 lb., fat 329.22. [19119] Vetic, 5986.9 lb., fat 238.67 (282). [24136] Kate 7884.7 lb., fat 351. [24137] Beauty, 8739.5 lb., fat 359.73; her [30940] Betty, 7092.4 lb., fat 292.75. [28208] Dolly, 9453.1 lb., fat 374.89 (334). [29605] Daisy, 8079.3 lb., fat 301.12; 12939.1 lb., fat 501.83 (352). [29972] Dell, 8459.6 lb., fat 294.67. [31224] Dale, 8350.4 lb., fat 293.11.

Breed Analyses: 167 Davy 5th, N. 800, RP. 200; 1451 Davy 27th, N. 628.12, S. 40.62, RP. 331.25 [24137] Beauty, N. 544.64, S. 99.42, RP. 355.89. [30940] Betty, N. 501.66, S. 180.17, RP. 318.11.

73 Buttercup—H2, which, as a 2-yr.-old heifer was a Royal and County winner, Mr. J. J. Colman bought at 100 guineas from Mr. Hammond, won yet other honors, and in due course the third of descent from her, 2123 Daisy Chain, was transferred to Whitlingham. 5th c., she recorded 7,650 lb. (478), 6th c. 6,580 lb. (361), and a 3-yr. av. followed 4,786 lb. (856). 2487 Red Daisy having the same gr. d., 823 Daisy 3d, also came: 3d c. 9,555 lb. (357), 4th c. 8,579½ lb. (311), then 7,485 lb. (325), and lastly 6th c.-11,269½ lb. (424). 4000 Easter, from the same dam—1474 Easton Daisy-1st c.-9,009½ lb. (617), and 5 calves after that, av. 5,022 lb. (1,436), fat 3.2 to 4.1. 2123's 7707 Daisy Chain-1st c.-7,524 lb. (357), fat 3.2; 6,809 lb. (305);

8,906 lb. (328). 1474's 3818 Whittingham Daisy was sold to Captain V. T. Hills with her 5190 Amaryllis, and her calf Whittingham Chief and H2 stock were thus introduced into the United States as H1 had been in 1882. Record of [26749] Flossie (5th in descent from Amaryllis), 9067.1 lb., fat 357.24; 12929.5 lb., fat 531.17. [28994] Flora (progeny of the same dam 16647 Floe, and sire Marmion 5674), 5316.5 lb., fat 234.64; 7,442 lb., fat 320.81.

Breed Analyses: 1474 Easton Daisy, N. 368.75 RP. 631.25. 3818 Whittingham Daisy, N. 450.15, S. 28.71, RP. 511.13. 5190 Amaryllis, N. 505.85, S. 4306, RP. 451.07. 16647 Floe, N. 516.82, S. 589.63, RP. 393.92. [26749] Flossie, N. 535.78, S. 92.19, RP. 371.96.

The Hudson Red Polled with its Reeve blood, as bred at Billingford for many years, was in 1859 introduced into the Elmham herd. A later addition 516 Ruby—I2 was bought in 1866 for the Marham herd, and the progeny got a further addition of the Reeve blood. Mr. A. J. Smith, in 1882, bought at Marham a young heifer 2791 Eyke Jennie. By a large measure of Suffolk blood was got 4018 Eyke Jane, 11-yr. av., 5943.34 lb.; highest record 8th c.-7,835 $\frac{3}{4}$ lb. (355). 4018's 7456 Squaw-1st c.-5,870 lb. (323), then 3-yr. av., 7,406 lb. (933); and 7845 Eyke Jessie, which transferred to Whittingham in October, in 1896, with 2d c. gave 8,852 $\frac{1}{2}$ lb. (371), fat 3.2; then 6,588 $\frac{1}{4}$ lb. (289), followed by 10,325 $\frac{1}{2}$ lb. (297), 10,624 lb. (320), 11,097 $\frac{1}{4}$ lb. (340). Breed Analyses: 2791 Eyke Jennie, N. 476.56, S. 77.34, RP. 446.9. 4019, N. 425.78, S. 324.60, RP. 249.60. 7845 Eyke Jessie, N. 429.88, S. 371.81, RP. 198.28. 7845's 16603 Eyke Jessie 2d-1st c.-6,914 $\frac{1}{2}$ lb. (327), and from 1906, 5-yr. av., 7210.4 lb. (1,487). 7456's 15900 Squaw 2d-1st c.-9,982 lb. (631); 2d c., 6,337 $\frac{1}{2}$ lb. (272). Third in descent from 2791, 12266 Eyke Judy, 3-yr. av., 6805.33 lb. (867); 13408 Eyke Jeannette, 6-yr. av., 7521.7 lb. (1,948); 15158 Jessie-1st c.-13,007 $\frac{3}{4}$ lb. (728); 13470 Eyke Joyous-2d c.-9,794 lb. (624); and 18027 Eyke-1st c.-7,385 lb. 18027's 21635 Echo, 3-yr. av., 6,586 lb. (963).

Mr. Savory, of Rudham Grange, was one of the early Norfolk adopters of the Reeve material. 19, I12, and I13 cows made a few records. 3272 Bridesmaid—I9 (bred at Troston), from 10th c., had a 4-yr. av. 8406.5 lb. (1,235). 6499 Lovely 4th—I12, 6-yr. av., 6,980 lb. (2,063), fat 4.0; highest record, 2d c., 8,265 $\frac{3}{4}$ lb. (350). 6501 Lovely 7th—I12-1st c.-4,774 $\frac{3}{4}$ lb., then 8-yr. av., 6416.3 lb. (2,452), fat 3.8 to 4.5. 18148 Lottie 2d—I12-1st c.-8,998 $\frac{1}{2}$ lb. 10343 Heroine—I13, 4-yr. av., 6,371 lb. (1,083). 2270 Jessie—I21 (the Hudson of Quarles strain), 8th c., 6,457 $\frac{3}{4}$ lb. (360).

Of the old-time Red Polled herds which were in the Kimberly district, only a few survived the rinderpest cattle plague. 6376 Gal 2d—K15 had a 7-yr. av., 8,005 lb. (2,302); top record, 8th c., 9,915 $\frac{1}{4}$ lb. (305). Gal 4th-1st c.-6,528 $\frac{3}{4}$ lb. (413), fat 3.8. 6376's 10185 Dorothy-1st c.-10,813 lb. (483). 3895 Atkins 2d—K17 (5th in descent from 90 Cherry, which B. Brown had rescued from the Coston herd), 7-yr. av., 5856.5 lb (2,084). Cherry's 599 Thursford Queen, at Thorneham, gave High Suffolk breeders access to the prime strain. 5876 Queen D. 3d (4th from 599), at Tring Park, 4-yr. av., 10,409 lb. (1,196). 13912 Minnow, 4 calves, av., 5,045 lb. (1,111); her 19899 Melton Majina-1st c.-5,483 $\frac{1}{2}$ lb. (308), then 6-yr. av., 8444.66 lb. (1,990). [22638]

Lady, 8370.7 lb., fat 313.70; 8189.8 lb., fat 286.88 (338); 9346.6 lb., fat 333.45 [27711] Lady 2d, 7405.4 lb., fat 277.4; 7631.5 lb., fat 290.76.

Of K18 there are only American records. [21885] Princess, 9,326 lb., fat 391.77. [36378] Rozelle, 10121.5 lb., fat 422.07. Of K19, only English 17264 Nellie 6th, 4-yr. av., 8657.5 lb. (1,252). 19075 Chedda, 5-yr. av., 7,085 lb. (1,327). K23 has only American records. [19435] Countess 2d, 5589.5 lb., fat 250.03 (242); 8,670 lb., fat 357.02 (347); 6539.9 lb., fat 229.45 (268). [24608] Jane, 9838.35 lb., fat 420.11; 9528.5 lb., fat 400.37. [24607] Jennie, 8155.4 lb., fat 341.23 (334); and her [31090] Jennie Red, 5342.2 lb., fat 272.3 (340); 5835.9 lb., fat 285.37 (315). [28454] Claw, 9420.9 lb., fat 413.34. K24 completes the Palmer of Wilby contribution to the K Group. 4911 Fragiel, 3-yr. av., 5789.9 lb. (756); her 7329 Miss Fragile-1st c.-5,853 $\frac{3}{4}$ lb. (441), and 4th in descent from 4911, 18036 Fanny, 2-yr av., 6,146 lb. (568).

K25 and K26 Families are progeny of two cows, each from an old herd near Watton. Grand-daughters of 3638 Patience: 9255 Found—K25, 10-yr-old record, 9,248 lb. (425), and 12009 Belle, 17,549 lb. (803). 12789 Plum was taken to Wisconsin by Mr. J. W. Martin, where, in 1905, was bred a gr.-dr. [24888] Pear, by Corporal 4313—T1-1st c.-6,387 lb., fat 262.98, followed by 9,183 lb., fat 445.45; 7616.2 lb., fat 338.68 (340); 9544.6 lb., fat 419.89; 13160.6 lb., fat 603.66; 9,177 lb., fat 407.17; 8183.1 lb., fat 372.2 (287). Pear's daughters [28991] J. D. Pear, 7,450 lb., fat 304.86 (322); 13538.4 lb., fat 546.34; 16598.4 lb., fat 407.24; [31726] J. D. L. Peach, 6115.3 lb., fat 271.87; 7264.4 lb., fat 312.54; 11557.2 lb., fat 501.08; and [33553] J. D. L. Plum, 8451.9 lb., fat 421.60. J. D. Pear's [35782] J. D. L. Pineapple, 6871.1 lb., fat 301.03. From [18801] Peach—which was also the dam of Pear—[28400] Pattie, 6,591 lb., fat 282.16 (304); 10490.3 lb., fat 435.14. Tracing to the same 1723 Patience, 12323 Fondle, 10-yr-old record, 6014.05 lb., fat 292.69 (335); [22712] Flora, 6553.25 lb., fat 263.83 (335, in milk 396); [24229] Freda, 8220.4 lb., fat 334.52; [26869] Fret, 6254.2 lb., fat 252.03 (257); [28397] Pretty, 8,482 lb., fat 270.74 (324); 9861.6 lb., fat 396.16.

Breed Analyses: Plum, N. 421.41, S. 381.40, RP. 197.15. Peach, N. 511.67, S. 209.74, RP. 278.55. Pear, N. 521.11, S. 135.43, RP. 343.42. J. D. L. Pear, N. 511.20, S. 156.53, RP. 332.22.

The only K26 records: 18896 Rude, 2-yr. av., 7,482 lb. 19748 Duel-2d c.-6,932 lb. (289).

L3 Family is descended from old Elmham stock, brought to Mileham. 19162 Ella, 4-yr. av., 8931.65 lb.; yr. 1914 record, 10,954 lb., fat 4.14 (321). 19759 Emma 7th, 2-yr. av., 6543.5 lb. (496). 22882 Wroxham Elf-1st c.-6,469 lb. (248); 2d c., 8,151 lb. (359).

L3 American records: [24874] Ethel, 9597.1 lb., fat 415.2, [25896] Upshot 2d, 9,959 lb., fat 370.17. [26618] Floss, 11602.9 lb., fat 449.99. [26619] Flora, 6982.3 lb., fat 262.11; 12,590 lb., fat 593.73. [28389] Missie, 6051.7 lb., fat 215.77 (317). [29275] Gipsy, 7411.8 lb., fat 305.65 (313). [29276] Goldie, 8248.5 lb., fat 304.43; 9289.1 lb., fat 360.99 (333). [29278] Gale, 6912.5 lb., fat 244.53 (357); 10664.4 lb., fat 400.13 (343). [29279] Hannah, 7592.4 lb., fat 305.89. [30939] Minnie's Last, 8476.3 lb., fat 308.79 (358). [33015] Rosa, 5196.9 lb., fat 213.34 (296). [33016] Blaze, 8087.8 lb., fat 262.47. [35139] Inez, 8373.7 lb., fat 320.44 (321); 11082.20 lb., fat 438.9.

4186 Lula—L9 (from a Wending herd)—1st c.-5,461 lb. (269), 4th c. 7,547 lb., fat 4.3 (297). 6997 Chestnut, 10-yr. av., 5289.4 lb., fat

3.8 to 4.7 (2866). Her 9014 Sweet Chestnut, 3-yr. av., 5,798 lb. (872). 9915 Wild Rose, 3-yr. av., 7444.66 lb. (1,024). 9014's 13627 Honest Wayward-3d c.-6,955 lb. (397); 5th and 6th c., 18,800 lb. (693). 19290 Lark, 7-yr. av., 7,345 lb. (2,312); highest record, 10,220½ lb., butter 459 lb. (302).

L12 from an old herd at Longham, 18148 Lottie 2d-4th c.-11,833½ lb. (329), 5th c. 11,728½ lb. (351). 19874 Kintore-1st c.-11443 lb. (723).

M2 Family, believed to be of A5 stock, introduced into the Marham herd. 2356 Marham, 1887-90, 4-yr. total, 26,510½ lb. (1,294). 7189 Hopeful, 6-yr. av., 6737.28 lb. (1,788); highest record, 8,067 lb. (315). M5 of Eaton stock, 4927 Glee-1st c.-7,791½ lb. (442), 2d c. 6,200½ lb. (287). 11270 Gay, 4-yr. av., 6,603 lb. (1,369). [28393] Gay, 7,219.3 lb., fat 326.66.

Of the N Group, there are records from N1 to 7 and N24, all tracing back to the early days of the 18th century, and N17, which from the Oakley strain, combined good form and substance with heavy milking qualities. As there are full records taken at Neeton Hall Farm 30 years, those are here selected to evidence the progressive inheritance.

1733 Phoebe—N1 got 13 calves: 8th to 10th c.-7955.66 lb. (970), 3-yr. lesser av., 6,146 lb. (877). Fourth in descent from 1733, 18548 Dame, 10-yr. av., 6981.1 lb. (3,166); her 22662 Longford Mandoline 3d c.-9,472 lb. (332). 18053 Frosty Face-3d c.-8,084 lb. (282); 5th c.-8,231 lb. (331); 10th c., 5,662 lb. (245). Her 21102 Cheriton Perdition-1st c.-12,401 lb. (427); 4th c., 8,690 lb. (320), and 22046 Cheriton Frost-1st c.-7,894 lb. (340).

Of N2 Family there are 42 records of descendants of 342 Minnie, which Lord Sondes bought of Col. Mason in 1856, and which was sired by the Red Poiled that won at the Norwich R. A. S. E. in 1849. Daughters went to Mr. Colman's at Easton, to Marham, and to Treston a while before the Herd Book was founded. 3244 Barbara, from the Marham stock, averaged with 5th and 6th c. 6318.75 lb. (646). Her 8028 Meddlesome-4th to 6th c.-av. 7684.66 lb. (1,262). 4th in descent from 3244, 20788 Melton Maggie-1st c.-8,149 lb. (350), then 4-yr. av., 8316.75 lb. (1,166), and in 1914-6th c.-10,733½ lb. (291). Her 22671 Melton Florry, 3 calves, 2-yr. av., 8839.5 lb. (685). 4th in descent from 3244, 13958 Muriel, 6-yr. av., 8143.5 lb. (1,759); top record-7th c.-10,219 lb. (316). 3d in descent at Treston from 342, 7373 Omelet-4th c.-11,425 lb., 5th c. 10,514 lb., 6th c. (11,045 (952); Her 9857 Sweet Omelet-2d c.-6,992 (318), 4th c. 7,832 lb. (371); 7-yr. av., 6942.14 lb. (2,337); 13600 Hastoe Tulip-4th to 6th c. av.-8513.33 lb. (802). 6th in descent from 342, 4997 Maggie, 8 calves, av. 6749 lb., fat 3.8 to 4.7 (2,452). Her 13823 Maggie 2d, 2-yr. av. 5520.5 lb. (569), and 13823's 17075 Maple-1st c.-6,104 lb. [34036] Minnie 2d, 7732.2 lb., fat 308.11; 9512.8 lb., fat 395.32. Breed Analysis: N. 548.76, S. 236.57, RP. 214.62.

Of N4 records 122: The earliest 1496 Empress 5th-10th c.-7-yr. av., 5470.28 lb.; top record-10th c.-8,738 lb. (257). Her gr.-dr., 9562 Mempriss-8th c.-7,291 lb., fat 3.99 (335); 8th c., 8,171 lb., fat 4.33 (256). 4th from Empress, 10746 Rustle, 9-yr. av., 7401.36 lb., fat 3.73 to 4.9 (3,182). 10207 Effigy-7th c.-8,438 lb., fat 3.4 (344); 10th c., 10,552½ lb., fat 3.2 (365); 12th c., 9,116½ lb., fat 3.8 (353). Her

18602 Expectation-1st c.-6,181 $\frac{3}{4}$ lb., fat 3.9 (337); 8-yr. av., 6130.37 lb. (2,413). Expectation's 21162 Evangeline 1st-5th c. av.-5511.8 lb.; 1915 record, 6,046 lb., fat 4.4 (295). 4388 Rosina 3d, 9-yr. av., 6480.1 lb., fat 3.7 to 4.5 (3,152); 8th c., 7,163 lb. (365); 9th c., 7,472 lb. (366). 4549 Eugenie 4th, 8-yr. av., 5171.1 lb., fat 3.6 (2,649); her gr.-dr., 11272 Geenie, 9-yr. av., 7355.6 lb., fat 3.4 to 4.15 (2,600, 4 last years milked 1,460 days). Geenie's 19220 Gemma, 9-yr. av., 9,009 lb., fat 3.7 to 4.4 (3,279, not dry 2d to 5th c.) [25106] Leona, 11069 lb., fat 469.52. [26498] Liza, 10807.75 lb., fat 545.25. [26501] Lily Davy, 9404.25 lb., fat 390.96. [29110] Luna Davy, 8,573 lb., fat 379.46. [30308] Popular Luna, 10,038 lb., fat 435.98. [31335] Popular Liza, 8,689 lb., fat 375.73 (305). [31352] Lady Rose, 9592.25 lb., fat 437.72. [31357] Luna Lassie, 10765.75 lb., fat 502.32.

Breed Analyses: 1496 Empress, N. 737.5, S. 159.37, RP. 103.12. Mempriss, N. 658.34, S. 137.24, RP. 304.40. Geenie, N. 461.95, S. 279.49, RP. 158.52. Gemma, N. 496.25, S. 170.30, RP. 333.40. [18552] Luna, N. 461.79, S. 190.72, RP. 347.44. [31357] Luna Lassie, N. 460.76, S. 285.07, RP. 254.13.

Of N5 the records are few. 5117 Sheba 2d, 9-yr. av., 8140.77 lb., fat 3.62 to 4.0 (3,145). Her gr.-dr.'s 18095 Sceptre, 4-yr. yield, 8,103 $\frac{1}{2}$ lb., to 9,360 lb., av. 8,403.87 lb., and 15893 Spitfire-1st c.-6,907 lb. (361).

The 50 records of N6 open with 3988 Daystar, 10-yr. av., 6,660 lb., fat 3.3 to 3.75 (last 3 yrs. 1,095). From the same dam, 2751 Daylight—N6, 9290 Dusk 4th-8th c.-5-yr. av., 7565.3 lb., fat 4.2 to 5.0 (1,667). Her 18587 Duchess-1st c.-6,904 $\frac{3}{4}$ lb., fat 3.5 (351) 10-yr. av., 7142.4. Duchess' 20316 Duchess of Necton-1st c.-7,487 lb. (365), 6-yr. av., 6587.6 lb., fat 3.4 to 4.3 (2,390); 5th c., 7,000 $\frac{3}{4}$ lb., fat 4.3 (330). 12216 Dot-1st and 2d c.-6,678 $\frac{1}{2}$ lb., 4,740 lb. (730), then 3-yr. av., 6217.75 lb., fat 3.8 to 4.20 (2,684); last year, 6,477 lb. (365). Her 21630 Dove, 2-yr. av., 7290.5 lb., fat 3.8 (630). 18471 Bifrons Queen-3d c.-8,100 lb. (411). 19103 Crescent-1st c.-8,073 lb. (500). 22328 Star 6th, 3-yr. av., 9925.5 lb., fat 4.7. 18162 Medlar-3d c.-9,074 $\frac{1}{2}$ lb. (289); 5th c., 10,040 $\frac{1}{2}$ lb. (308); 5 other years' av., 7,939 lb. (1,601).

Breed Analyses: Daylight, N. 490.23, S. 248.33, RP. 26142. Daystar, N. 519.49, S. 164.0, RP. 256.49.

3038 Princess—N17 record, made 30 years ago, 8,030 lb. (304), then 2-yr. av., 6471.5 lb. (644). Her 3d in descent, 11038 Caister Princess-5th c.-6,680 $\frac{3}{4}$ lb. (319). 20217 Bockmer Carnation-3d c.-5,197 lb. (319). 1724 Patsie—N23-5th c.-7,420 lb. (311); 6th c., 7,563 $\frac{1}{2}$ lb. (307). Her gr.-dr., 11684 Pearl 1st c.-4,646 lb. (428), then 4-yr. av., 7,270 lb. (1,264).

Reference has been made to Sir Edward Kerrison's good work at Oakley and Brome, on the northwest border of High Suffolk. There would seem to have been no private register of breeding, while Red Polled cattle were frequently sent by him as competitors from the Cambridge R. A. S. E. Show in 1840. The earliest milk records are of the closing years at Whitlingham of 2446 Pink—O1. Her 3242 Ashlyns Pink, 3-yr. av., 5513.33 lb.; 3913 Carnation, 4th to 6th c., av. 677.133 lb. (1,409); 12th and 12th c., av. 7,115 $\frac{1}{2}$ lb. (790); and 6171 Ashlyns Sybil, 5-yr. av., 7797.4 lb. (1,407). 3913's 7645 Ashlyns Carnation 2d, 7-yr. av., 6650.8 lb., and 17892 Ashlyns Carnation 6th-4th c.-7,109 lb. (364). 7645's gr.-dr., 19900 Majimino 5th-8th c.-av., 8402.25 lb. (1,270); her 23126 Melton Princess 1st, 5,165 $\frac{1}{2}$ lb. (320).

Daughters of 1362 Careless—O2 recorded at Whitlingham: 2875 Headless, 6-yr. av., 7545.2 lb. (1,836); 5th c., 12,679 $\frac{1}{2}$ lb. (536); 6th

c., 10,642 $\frac{1}{4}$ lb. (395); and 2672 Careful-1st c.-8,137 $\frac{1}{4}$ lb. (441); 3d c., 14,408 $\frac{1}{4}$ lb. (595); 4th c., 8,717 $\frac{1}{4}$ lb., fat 4.3 (357); and other 4-yr. av., 6322.19 lb. Careless' 7697 Beth-1st c.-5,295 $\frac{1}{4}$ lb., then 3-yr. av., 5240.5 lb. (885). Careful's 9223 Comic-1st c.-6,311 $\frac{1}{2}$ lb., fat 4.7 (476), then 6-yr. av., 7627.2 lb., (1,792); and 10086 Careful 2d, 6-yr. av., 6664.5 lb. (1,827). 13198 Beth 3d-1st c.-6,658 lb. (353).

Breed Analyses: Careful, N. 368.75, S. 454.68, RP. 176.56. Careful 2d, N. 431.25, S. 264.06, RP. 304.68.

15720 Rendlesham Cowslip—O3, 3-yr. av., 8669.66 lb.; 4th c., 11,352 lb. (365). 11211 Eyke Jewess (14 calves), 71,800 $\frac{1}{2}$ lb. (4,239).

548 Silence—O9 came to Mr. J. J. Colman's herd from Sir E. Kerrison's. Her gr.-dr., 2536 Silent Beauty, was transferred to Whittingham when 3-yr.-old, and her first record was 6,321 $\frac{1}{4}$ lb. (313), 5th c., 11,133 $\frac{3}{4}$ lb. (556), 8-yr. av., 6,313 lb. (2,338); last year's record, 7,357 $\frac{1}{4}$ lb., fat 4.9 (287). Her 3860 Barmaid-1st c.-7,571 lb. (451); 6783 Sprite, 5-yr. av., 5476.8 lb., fat 3.9 to 4.2 (1,581). 2156 Dummy last 2 yrs., 8,324 lb. (290), 6,582 lb. (306). 5431 Dummy 2d-9th c.-8,049 lb., fat 3.4 (257); her 11177 Doris-1st c.-8,138 lb. (462), and 14855 Dummy 5th-1st c.-6,421 $\frac{1}{4}$ lb. (476); 2d c., 6,021 lb. (288). Barmaid's 6902 Barbara, 2-yr. av., 5830.8 lb. (543). 6902's gr.-dr., 16148 Barbara 4th-1st c.-4,907 lb. (338), 2d c., 6,206 lb. (341). Doris' 14845 Dot-1st c.-4,281 $\frac{1}{2}$ lb. (294).

Breed Analysis: Silent Beauty, N. 427.34, S. 213.08, RP. 359.57.

The unique record of 2728 Crocus—O11 by Cato 468, I told years ago, but it bears repeating. Her 1st c., 11,178 $\frac{1}{2}$ lb. (523 days from 18th September, 1887, to 22d February, 1889), 21 days after 2d c., and milked to 17th April, 1890, 11,450 $\frac{1}{2}$ lb. (397); 3d c. on 11th May, and a mishap, which led to the veterinary certifying that she was incapable of further breeding. The order was given to milk as long as possible and then fatten. From 19th June, 1890, she milked to 30th September, 1899. By 31st December, 1891, she had added 15,055 lb. to her record, fat 5.0 to 5.4. In 1898 she gave 3,540 $\frac{3}{4}$ lb. (365), and in the nine months of 1899, 1,690 $\frac{3}{4}$ lb., 6.17 lb. per day on grass feed, fat 4.3; live weight, 1,831 lb., when slaughtered early in October. Total yield in 9 yr. 4 m., 50,593 lb.; her 12 yr., 9 days, 72,221 $\frac{3}{4}$ lb.; dry 51 days only.

Crocus' gr.-dam was 1229 Thornham Polly, and 5 generations later 19298 Little Mary, was bought by Mr. A. J. Smith. 1st c., 6,369 lb. (290); 2d c., 8,079 lb. (302); 3d c., 8,868 lb. (336); 4th c., 5,923 $\frac{1}{2}$ lb. (365). Her 20891 Rendlesham Little Mary-1st c.-7,029 $\frac{1}{2}$ lb. (331); 3d c., 7,230 $\frac{1}{2}$ lb. (296) and 22267 Rendlesham Mary, 6,269 $\frac{1}{2}$ lb. (369).

6341 Eyke Ruth—O13-1st c.-7,355 lb. (298); 2d c., 5,685 lb. (293). Her 8959 Ruth, 8-yr. av., 6358.62 lb. (2,602). 15728 Rendlesham Early-1st c.-5,864 lb., then 8-yr. av., 8402.37 lb. (2,505); 8th c., 10,752 lb. (332). 22428 Ashmoor Red Rose-1st c.-5,534 lb.; 2d c., 6,112 lb. (353).

31 records of O14. 5374 Creamy-1st c.-5,831 $\frac{1}{2}$ lb. (506). 9006 Comely-1st c.-5,486 lb. (315). 8940 Rosette-3d c.-9,377 lb. (291); 5th c., 12,233 lb. (290); 6th c., 12,654 lb. (341); 7th c., 10,641 (287); 8th c., 10,806 lb. (306); 9th c., 10,392 lb. (330); 11th c., 8,943 lb. (364); 12th c. and last, 8,471 lb. (294). Her 10718 Rosebush-1st and 2d c.-9,033 lb. (350); 3d c., 9,919 lb. (371); 5th c., 10,069 lb. (321); then 2-yr. av., 9160.5 lb. (550). Breed Analyses: Rosette, N. 393.79, S. 494.57, RP. 111.62. Rosebush, N. 373.03, S. 343.37, RP. 283.54. 10718's 17977 Crimson Rambler-1st c.-6,105 lb. (314); 4-yr. av., 6761.75 lb. Sixth in descent from the head of the O14 Family, 772 Cherry—O14, while Rosette was 3d in descent, 12919 Rosie Bud, 8-yr. av., 8842.3 lb. (2,508); highest record, 9,773 $\frac{1}{2}$ lb. (365). Her 14149 Rendlesham

Rose-1st c.-6,043 lb. (275), and this 1st calf's 18859 Rendlesham Rosa, 5-yr. av., 6833.8 lb. (1,400).

Of other lines of O14 breeding, 19384 Omega-2d c.-9,411 $\frac{1}{4}$ lb.; 3d c., 11,684 $\frac{1}{4}$ lb.; 5th c., 10,186 $\frac{1}{2}$ lb.; 6th c., 9,595 $\frac{1}{2}$ lb.; 7th c., 11,450 $\frac{1}{4}$ lb.; 8th c., 10,342 $\frac{1}{2}$ lb.; and her 20471 Omega 3d, 9,256 lb., 9,899 $\frac{1}{4}$ lb., 10,464 lb. 20765 Kettleburgh Rosie 3d, 7-yr. old, 12,192 $\frac{3}{4}$ lb.; her Kettleburgh Rosie 4th, 10,242 $\frac{1}{2}$ lb. 19696 Canterbury-1st c.-8,266 lb.; her 21082 Canterbury Bell, 5-yr. av., 6804.2 lb. (1,452); highest record, 1915's 8,062 lb. (279).

10194 Duchess—O16-2d c.-9,921 lb. (362); 4th c., 9,679 lb. (364); 5th c., 11,843 lb. (364). Her 12303 Hasteo Damsel-2d c.-6,054 lb. (320).

Nicholas Powell, whose family, farmed at Little Snoring, near Fakenham, 100 years, was, till railways were established, a noted breeder of the Hackney horse. Like many a Norfolk farmer, he thought the novelty would be fatal to the trotting horse. So he turned his attention to the breeding of Red Polled cattle. He knew all the desirable qualities of the stock, as John Reeve had bred them just five miles distant from Snoring, and that the son-in-law, England, had just parted with his good cows. Their whereabouts he also knew. So of the Binham Red Polled he secured five heifers for 45 lbs. Further, he knew where the Reeve stock had been well and freely used, got a bull from Fisher Bradfield at Elmham, and later one from Ben Pond at Dunham. That judicious selection for great depth of color, good form, and milk yield well and over a long period had been his rule I found when I visited him in the autumn of 1873. He had kept no memoranda of breeding, but though well in years his memory was good, and I was made to realize that the Powell blood meant at least four parts of every five a Reeve product. Ben Brown, of Thursford, had, before I knew Powell, bought of his best; had supplied and had bred from them, and, as I have said, thus rescued the fruits of Reeve's and Powell's care from the cattle plague.

The only available records of P1 are descendants of 372 Nelly (gr.-dr. of 243 Handsome, the foundation cow). Nelly's 1069 Penelope, bred by Mr. Fulcher, was added to the Marham herd. Her 3054 Plausible recorded at Whitlingham-1st c.-4,503 $\frac{1}{4}$ lb. (277), 2d c. 6,161 lb. (333); and her 3040 Palm had two daughters there, 11666 Palm Branch -1st c.-6,223 lb. (294), then 4-yr. av., 8693.5 lb. (1,175), and 11667 Palm 3d c.-7,840 lb. (322). Palm Branch's 18268 Pamela recorded-1st c.-6,043 lb. (315), 2d c. 5,972 lb. (314), 3d c. 8,281 lb. (334). 8821 Patience, 3d in descent from Penelope, made records by her 18784 Passion, 7-yr. av., 7,156.24 lb.; highest record in 1912, 8,613 lb, fat 3.8; and 20173 Pansy, 6-yr. av., 8422.16 lb., followed in 1914 and 1915 by 10,306 lb., fat 3.9, and 10,472 lb.

P2 records opened with 2263 Ivy, progeny of 1588 Isabel, 3d in descent from 572 Strawberry, the foundation cow. Ivy's 5-yr. av., 5195.75 lb. (1,689); highest record, 6,166 $\frac{1}{4}$ lb. (314). Her 6569 Miss Ivy-1st c.-4,129 (322); 11-yr. av., 4,685 lb., fat 3.5 (3,036). 2044 Brunette, bred by Mr. Colman, was at Whitlingham from 3d c., 5-yr. av., 5178.84 lb., fat 3.2 (1,411). Her gr.-dr., 101916 Aconite, 8-yr. av., 5358.78 lb. Third in descent from Brunette, 20488 Primrose, 3-yr. av., 7873.5 lb. (923); and 20786 Mayflower, 4-yr. av., 8623.25 lb. (1,227); highest record in 1914, 10,654 lb. (333). Primrose's 23333, The League-1st c.-8,781 lb. (333), 2d c. 7,489 $\frac{1}{4}$ lb. (286).

The Rose—P3 Family has been the most successful of the Group in the prize ring and in popularity. In one herd in Norfolk there were

at the opening of the present year 119 cows and heifers, and in another 12—descendants of 479 Rose 2d, while in several other herds the P3 traced back to 600 Thursford Rose, another daughter of 478 Rose. There are 56 P3 records. The earliest, 731 Broom, which was in the Stoke herd, and daughter of 479, 10th c., 6,443 $\frac{3}{4}$ lb. (530); 11th c., 8,575 lb. (340). Her 3896 Brindy-1st c.-4,291 (390). Other gr-drs. of the same cow, which Mr. Colman bought of B. Brown, made their records at Whitlingham: 2032 Blush Rose, 4-yr. av., 6,825.25 lb. (1339); 7th c., 8,050 lb. (406). 2386 Rosy Morn-2d c.-6,955 $\frac{1}{2}$ lb. (286), then 5-yr. av., 7,484.4 lb., fat 3.5 (1,603). 2386 My Lady-2d c.-6,955 $\frac{1}{2}$ lb. (286), then 5-yr. av., 7,484.5 lb., fat 3.5 (1603). My Lady's 6584 My Lady 2d-2d c.-7,055 $\frac{3}{4}$ lb., fat 4.0 (294). 6th in descent from 479, 6717 Roseleaf-1st c.-5,662 $\frac{3}{4}$ lb., fat 4.4 (391); 3d c., 7,356 $\frac{3}{4}$ lb., fat 3.3 (363). 6584's 9086 Young Lady-1st c.-5,354 $\frac{1}{4}$ lb. (343). Fifth in descent from 1830 Ruby Rose—exported to America in 1882, and which was third in descent from 479 Rose—was 12202 Easter, which though in milk 40 days when entering the test, recorded, at the Pan-American Exposition, 6,085 lb. in 184 days, and produced 264 lb. butter. Sixth in descent from 479, fourth from 1146 Rose 5th (the dam of Ruby Rose) [41004] Pear's Sister, 7,555 lb., fat 316.57 (298).

The most complete records, coming from 1896 to the present time, of descendants of 479 Rose 2d, have been made at Necton Hall. 7085 Eugenie-4th c.-5,158 lb., fat 3.8 (365); 8th c., 7,199 $\frac{3}{4}$ lb., fat 3.25 (352). Her 9120 Baroness-1st c.-4,563 lb., fat 3.8 (403); and 18309 Sporle Eugenie, 8-yr. av., 7,023.56 lb., fat 3.6 to 4.2 (2,711). Her 22541 Egeria-1st c.-5,190 $\frac{3}{4}$ lb., fat 3.6 (300); 2d c., 6,141 lb., fat 4.9 (306). 8502 Emily, 10-yr. av., 7,672 lb., fat 3.4 to 4.4 (3,832). Her 18504 Emerald, 3-yr. av., 6,224 lb., fat 4.06 to 4.6 (937). Breed Analyses: Emily, N. 491.37, S. 101.81, RP. 406.78. Emerald, N. 560.75, S. 94.73, RP. 344.48. Emerald's 21156 Eleanor, 3-yr. av., 6,193 lb., fat 4.1 to 4.8 (1,090). 9643 Palgrave Rosa, 6-yr. av., 5,870.54 lb., fat 3.6 to 4.15 (2,142). Her 19394 Pearl-1st c.-5,884 lb., fat 3.5 (348); 3d c., 8,160 $\frac{3}{4}$ lb., fat 3.25 (358). [23441] Cresco Queen, 8,380.5 lb., fat 329.67 (328).

To 389 Nina 2d P4 most of the recording cows trace back. 2028 Blue Bell-9th c.-7,585 $\frac{1}{2}$ lb. (302). Her 2031 Blue Bonnet-3d c.-7,033 $\frac{1}{2}$ lb. (312), 4th c. 8,036 $\frac{3}{4}$ lb. (370), 6th c. 7,603 $\frac{1}{2}$ lb. (292), 7th c. 6,893 $\frac{1}{2}$ lb. (303). 5650 Linda, 5th from 389-7th c.-6,463 $\frac{1}{2}$ lb., fat 3.6 (273); 8th c., 7,297 $\frac{1}{2}$ lb. (301). Her 13767 Linda 3d was transferred after her 1st c. from Whitlingham to Sir Walter Corbet at Acton Reynold, Shrewsbury, where she is yet in Sir Gerald V. Corbet's herd, and a 17-yr.-old cow, bred in June, 1915, 25215 Linda 4th. Linda 3d's published record may well be set down year by year—2d c.-8,900 $\frac{3}{4}$ lb. (329), 9,084 $\frac{1}{2}$ lb. (336), 9,985 lb. (319), 10,605 $\frac{3}{4}$ lb. (345), 11,026 $\frac{3}{4}$ lb. (344), 10,635 $\frac{1}{2}$ lb. (351), 9,834 $\frac{3}{4}$ lb. (305), 8,520 $\frac{3}{4}$ lb. (312); 15th c., 9,098 $\frac{1}{2}$ lb. (323). Linda 3d's 20180 Acton Fillpail 1st, 4,615 $\frac{1}{4}$ lb. (169), 9,847 lb. (348), 11,027 $\frac{1}{2}$ lb. (358). Linda 3d's fat record at a R. A. S. E. test was 3.32.

On another line of breeding from 389 Nina 2d, through stock bred near Epsom by Sir John W. Hartopp, and taken by Lord Maurice Fitzgerald to Johnstown Castle, Wexford, came 16483 Desirée of Johnstown, whose record at Acton Reynold was 2d c.-10,630 $\frac{1}{2}$ lb. (316); then 4-yr. av., 9,142.3 lb. (1,247). Another gr-dr. of 5413 Donna Gloss, 19503 Shamrock-1st c.-5,298 $\frac{3}{4}$ lb. (184), then 8,413 $\frac{1}{2}$ lb. (320). Desirée's 1905 R. A. S. E. fat test was: a. m. 4.14, p. m.

5.10; other solids, a. m. 9.04, p. m. 8.97. At the 1907 Dairy Show: Fat, a. m. 3.91, p. m. 4.49; her butter ratio, 26.88.

Breed Analyses: Linda, N. 368.75, s. 7069, RP. 560.54. Linda 3d, N. 547.54, S. 49.46, RP. 492.49. 5413 Donna Gloss, N. 544.92, S. 12.0, RP. 443.06. 9431 Johnstown Gloss, N. 571.57, S. 65.33, RP. 363.05. Desiree of Johnstown, N. 517.05, S. 195.53 RP. 287.37.

Yet one more Family of Nicholas Powell's breeding, P7, was in 1880 transferred to Lord Hastings for the newly-formed herd at Melton Constable. Records have been kept from 1893. 8013 Maid of Honour-2d c.-9,296 lb. (561), then 4-yr. av., 6,277 lb. (1,103). Her 18167 Milkmaid, 3-yr. av., 8799.8 lb. (990); then 5th c. 10,549½ lb. (330), 6th c. 11,277½ lb. (364); and 19901 Mandoline, 4-yr. av., 7000.25 lb. (1,307); then 6th c. 10,308 lb. (357). P9 also of the Powell stock has records: 19461 Retreat, 10-yr.-old, 9,691¼ lb. (286), 7,188 lb. (272); and her 21803 Red River, 4-yr. av., 6668.93 lb., fat 3.77 (1,240). [29285] Lucile, 8,151 lb., fat 316.38.

In Mr. E. Cooke's herd at Stalham was Q1, based probably on Pond stock. 3953 Countess, transferred to Whitlingham-1st c.-6,345½ lb. (440), then 4-yr. av., 8799.56 lb., fat 3.4 to 3.6 (1,260); next 6th c., 10,876½ lb. (343), and 2-yr. av., 8,988 lb. (637). Her 6270 Countess 2d-1st c.-10,442½ lb. fat 4.3 to 4.7 (560); after 69 days-2d c.-8,143½ lb. (364); 27 days dry, and began a 5-yr. av., 8807.57 lb., fat 3.6 to 3.8 (1,688). 6270's 8745 Miss Countess-1st c.-5,972 lb. (405), 3d c. 7,259 lb. (347); 9230 Countess 3d-1st and 2d c.-6,450 lb. (287); and 12107 Celia-1st c.-5,146½ lb. (229), then 2-yr. av., 6997.5 lb. (655), and 4th c. 10,017¾ lb. (350). Also records of 3953 Countess' progeny: 9199 Cherry 2d, 4-yr. av., 6,555 lb. (1,218); 11292 Glossy, 7-yr. av., 7222.4 lb. (2,255); highest record-5th c.-8,587 lb. (343); and 12127 Choice-1st c.-5,179¾ lb. (385), then 2-yr. av., 6299.87 lb. (616). 3863 Beatrice-4th c.-8,041½ lb. (280); her 7668 Beatrix-5th c.-8,265 lb., fat 4.3 (347), and her 10695 Beamish-1st c.-3,656 lb., fat 4.01 (300); 2d c., 6,010 lb., fat 4.3 (365). Fourth from 9199, 11292 Glossy's 21069 Brilliantine, 3-yr. av., 7664.66 lb. (864); then 5th c., 9,454 lb. (287); 6th c. in year 1915, 10397 lb. (320). Her 24703 Longford Marjorine-1st c.-5,657 lb. (269), from February 15th, 1915.

Breed Analyses: Countess, N. 669.13, S. 154.97, RP. 175.87. Glossy, N. 577.53, S. 114.98, RP. 307.46. Brilliantine: N. 518.69, S. 125.66, RP. 355.60.

Mr. C. Etheridge, of Starston, had 30 years experience of the Red Polled from 1822. He presumably was a buyer, when in that year, Mr. George sold some of the new breed, and used it on the High Suffolk Polled, for Mr. George, desirous of fresh blood in his herd at Eaton, got it from Mr. Etheridge. In 1853 one of his cows was added to the Stoke herd, and thus added the old stock—R1—to the new Herd Book twenty years later.

In Lord Rothschild's herd, 6164 Artful Anna, 4-yr. av., 6364.25 lb.; her 10948 Artifice-6th c.-7249 lb. (305), and her get, 18422 Artless-4-yr. av., 7719.75 lb. (1,355). From Artifice also 21093 Cheriton Artful, 4-yr. av., 7542.25 lb. (1,037). 20672 Cheriton Art-1st c.-6,285 lb. (365); then 5,408 lb. (231), 21094 Cheriton Article-2d c.-8,281 lb. (350); 4th and 5th c., 14923 lb. (666). Fourth from the Stoke-bred 3542 Sophie—R1, and out of 6801 Sunlight, was 9853 Sunshine, 3-yr. av., 6873.75 lb. (903). From the same d. 15080 Heytesbury Moon-

light-2d c.-5,900 lb. (278). The last named cow got 15079 Heytesbury Moonbeam, 2-yr. av., 5836.5 lb. (577), and 15079 got 16801 Heytesbury New Moon-4th c.-7,254 lb. (289), and then 4-yr. av., 6781.25 lb. (1,094). Her 20394 Heytesbury Moon-struck, 2-yr. av., 7623.5 lb. (620).

Breed Analyses: Artful Anna, N. 269.62, S. 528.88 RP. 201.48 Artifice, N. 336.95, S. 404.08, RP. 258.94. Artless, N. 353.28, S. 399.40, RP. 247.29.

In other Families of R Group, the bulls used during 20 years were particularly from Mr. James Read's herd at Laxfield, High Suffolk.

3037 Nun R2 is the only English record, 3-yr. av., 6105.3 lb. (978). There is also one American [29199] Rune, 9231.4 lb., fat 330.69 (379).

R8 and R11 were in Mr. Thomas Easter's herd, founded in 1856 at Ravenglass, from both Norfolk and Suffolk stock. Cows from his son's (Mr. W. B. Easter) herd at Stockton in the Waveney Valley, the wealthy border-land of High Suffolk, were transferred to Whitlingham when its herd was being started. 2153 Dorcas—R8-3d c.-8,286 lb. (328), 5th c. 9,814 1/4 lb. (372), 6th c. 8,737 1/2 lb. (322), fat 3.5. Her 6306 Dorcas 2d-1st c.-5,218 1/2 lb. (376), 2d c. 6,053 1/2 lb. (280). 6136's 10165 Diana-1st c.-5,451 1/4 lb. (300). 5657 Lively—R8, 5-yr. av., from 3d c., 4,890 3/4 lb., fat 3.7 (1,302). Her 8000 Lively 2d-4th c.-6,204 3/4 lb. (313); 12543 Lena-1st c.-5,388 lb. (370); and 15280 Lively 3d, whose gr.-dr. 19214 Foliage, yet in profit, 3d c., 9,544 lb. (366), then 6-yr. av., 7,295.57 lb. (1,616). [34064] Easter Blossom, 7291.55 lb., fat 282.62 (264).

5296 Brundish Pretty—R9, the only R9 record, 1st c., 11,570 1/4 lb., fat 4.0 (700). After 35 days-2d c.-5,095 1/2 lb. (329).

The R11, which Mr. Garrett Taylor bought on 17th May, 1888, 1513 Fillpail, had on the previous February given birth to her 6th calf. Her record from 18th May to 17th January, 1889, was 7,722 lb. (231). Then from 4th March, 11,077 lb. (375); maximum weekly yield, 372 lb.; yield in 13th week of record, 308 3/4 lb., in 26th week 182 1/2 lb.; 84 days rest, and then 8th-c.-12,961 1/2 lb. (469). 9th c. 8,746 1/2 lb. (318); then 3-yr. av., 7,273 lb., fat 3.4 (605). Year 1898 record, 8,801 1/4 lb.; her 12th and last calf was born on 14th August, 1897, and she milked to 4th September, 1899, 13,637 1/4 lb. (752 days). Total yield at Whitlingham, 88,699 3/4 lb. (3,178). Fillpail's 1st c. born at Whitlingham was 4891 Fawn, and Fawn's 13th c. was born on Jan. 30th, 1903. Fawn's total yield to December 31st, 1904, was 89,507 lb. (3,428 days). The successive yearly yields were 7,598 lb. (420), 6,044 lb., fat 3.5 (247), 8,066 3/4 lb. (280) 9,655 1/2 lb., fat 4.4 (301), 7,572 3/4 lb., fat 3.4 (266), 8,692 1/2 lb. (270), 9,875 1/4 lb., fat 4.0 (326), 8,663 1/4 lb. (302), 9,793 3/4 lb. (322), 8,375 3/4 lb. (329), 4,788 lb. (202).

Fillpail's 3745 Snowdrop-6th c.-5,815 1/4 lb. (217); and 10258 Fillpail 2d-2d c.-9,019 1/2 lb. (322). Fawn 12321 Folly-2d c.-7,174 lb. (340), 6,802 lb. (189), 5,282 lb. (329). Fillpail's gr.-dr., 18030 Famous, 4-yr. av., 8033.25 lb. (1,079), and from the same dam, 20677 Cheriton Fame-2d c.-6,760 lb. (345); 19766 Familiar, 3-yr. av., 6495.33 lb. (673); and 20335 Daisy-1st c. December 1st, 1907, yield to 31st December, 1909, 10,791 lb. (546). 20677's 22044 Cheriton Fame 4th-2d c. 6,720 lb. (245), 3d c. 7,834 lb. (317).

Breed Analyses: Fillpail, N. 276.5, S. 507.81, RP. 215.62. Cheriton Fame, N. 422.36, S. 302.31, RP. 27527.

5409 Dolly, whose dam 1092 Pretty was also dam of 1513 Fillpail recorded-1st c.-6,981 1/2 lb. (294), and in four of her nine years

an average of 9084.6 lb. Her 11137 Damsel-1st c. 6,852 lb. (406); 9272 Dolly 2d-2d c.-6,412 lb. (273). Damsel's 17988 Damsel 2d-1st c.-8,849½ lb. (500), and without a dry time-2d c.-5,239¾ lb. (371).

Two cows from an old Norfolk herd at Hapton were bought by Mr. Henry Birkbeck some 72 years ago to found a herd at Stoke Holy Cross, and pedigrees noted. Records of milk yields were kept when the stock was transferred to Whitlingham. 9207 Chocolate—S1, 2-yr. av., 4695.5 lb. (679). Her gr.-dr., 20393 Hester, 2-yr. av., 6822.5 lb. (647).

2449 Beauty—S2-8th and 9th c.-16,249 lb. (645). Her gr.-dr., 16137 Ashlyns Rose 2d-3d c.-8,736 lb. (364), then 3-yr. av., 7120.66 lb. (965). 16137's 18946 Sweet Briar, 7-yr. av., 7470.85 lb. (2,122); 20512 Red Rose, 3-yr. av., 6,128 lb. (387); and 21716 Longford Dewberry, 4-yr. av., 8609.5 lb. (1,325); highest record, in 1915, 5th c.-9,687 lb. (321). 5975 Slane Beauty, bred in Co. Meath, 4-yr. av., 5704.25 lb. (1,212). 19827 Heytesbury Primrose, of the same line as Ashlyns Rose, 5-yr. av., 5996.6 lb. (1,314); her 21201 Heytesbury Pansy 1st, 5,554 lb. (241), then 4-yr. av., 6,650 lb. (1,353).

Of Dowson—S; blood, with a succession of Powell blood at Stoke, 2124 Damson, 3-yr. av., from 6th c., 6,858 lb. (878). 2870 Heach-5th c.-10,693 lb. (423), then 7-yr. av., 7,273 lb. (2,193); highest record-9th c.-9,238½ lb., fat 4.0 (364). Her 8597 Hilda-1st c.-8,753½ lb., fat 3.4 (476). Third in descent from Heach 12384 Hemp-4th c.-6,326½ lb. (308), then 3-yr. av., 6286.8 lb. (960). Her 17878 Acton Cherry-1st c.-5,153½ lb. (345), then 4-yr. av., 5395.5 lb. (1,151); and 18974 Acton Cherry Blossom-1st c.-6,661 lb. (309), then 3-yr. av., 6,170 lb. (930). [30634] Margarita, 6999.7 lb., fat 235.07.

Breed Analyses: Heach, N. 512.5, S. 88.63, RP. 398.71. Harp, N. 517.24, S. 109.40, RP. 373.32. Acton Cherry Blossom, N. 478.95, S. 113.04, RP. 407.96.

The T Group included a number of Families which had been bred in the district adjacent to Walsingham. It may be presumed that they were for the most part descended from cws of the selection made by the two John Reeves and the Englands. The earliest record of T1 Fainly was 2474 Prudish, gr.-dr. of 440 Primrose: 3d c. 7,524 lb. (368), 6,422 lb. (334), 7,662½ lb. (265); then 4-yr. av., 4293.8 lb., fat 3.2 to 4.4 (1,082). From the same dam as Prudish 3064 Prim, 5-yr. av., 4527.7 lb. (1,309); highest record-5th c.-5,855 lb. (245).

2716 Coronet was more noteworthy—(she was also a gr.-dr. of Primrose)—2d c. 9,103 lb. (346), 3d c. 12,253 lb. (387); and while she was yet yielding 175 lb. per week Mr. J. McLain Smith took her to America in the summer of 1890. Her 5367 Coronet 2d, which was then a yearling at Whitlingham, began her record with 5,653½ lb., fat 3.2 (301); 2d c. 5,431½ lb., fat 3.6 (287); 3d c. 7,359½ lb. (359), 4th c. 8,770½ lb. (334); then 2-yr. av., 6,911½ lb. (581), and in the next year she was exported, leaving her yearling 14723 Coronet 3d-1st c.-9,963½ lb. (539); dry 52 days, then 2d c., 8,050½ lb. (317); 3d c., 8,022½ lb.; 4th c. dropped January 18th, 1905, and was sold April 12th. Her record from that date, at Lord Rothschild's to 30th September, 6,427 lb. (268), continuing succeeding 365 days, 4,685 lb.; then 5th c., 8,378 lb. (252); 6th c., 6,965 lb. (245); was taken to Thornville, Co. Wexford, where 2-yr. av., 6,628 lb. Her later records in 1913 and 14, were 5,607 lb. (288), 4,861 lb. (252). None of her prog-

eny at Tring Park were registered. At Thornville, of her twin daughters, 24392 Thornville Red Coronet has begun her record in 1915 with 3,554 lb. (161), and the old 17-yr. cow has produced her 13th calf. The first of the Coronets would seem to have a remembrance in the United States, a descendant having been registered as bred in 1911 in Oklahoma.

Breed Analyses: Primrose, N. 700, RP. 300. Coronet, N. 587.5, S. 35.93, RP. 376.56 Coronet 2d, N. 478.12, S. 76.55, RP. 445.31. Prudish, N. 640.62, S. 44.52, RP. 314.84. Coronet 3d, N. 514.88, S. 72.46, RP. 412.64.

5169 Tryste—T4, bred at Whitlingham in April, 1888, was one of the five Red Polled which took part in the 1901 Pan-American Exposition test, at the outset being 70 days in milk. Her 184 days' record was 5,422 lb., butter 235 lb. Her 1st c. record at Whitlingham was 6,260 $\frac{3}{4}$ lb. (390), 2d c. 6,039 lb. (329), when she was taken to America by Captain V. T. Hills.

Born 5 years earlier from the same dam, 1896 Tipple, 3183 Tin-2d c.-5,393 lb. (325), 4th c. 10,344 lb. (487), 5th c. 8,512 lb. (357); 8,447 $\frac{1}{2}$ lb., fat 3.7 (357); 7,089 $\frac{1}{2}$ lb., fat 4.1 (315). Her 5170 Tulip-1st c.-4,162 $\frac{1}{2}$ lb. (322), then 2-yr. av. 6,039 lb., fat 5.1 to 4.6 (649). Tulip's 6819 Top-1st c.-11,582 lb. (589), 29 days dry, and 2d c. 5,094 lb., fat 3.7 (217); then 4-yr. av., 7068.5 lb. (1,184). Of later records: 14121 Red Lass-3d c.-6,070 lb. (208), 5th c. 6,107 lb. (321). 19400 Red Rose-2d c.-6,028 lb. (259) 3d c. 6,169 $\frac{1}{2}$ lb. (281). 21099 Cheriton Fancy-2d c.-12,964 lb. (565).

1315 Bee-Bee—T6 has the earliest record-7th c.-9,935 lb. (383). Her 2021 Blacking, 8,507 lb. (371), and 5242 Bess-1st c.-8,350 lb. (516). Blacking's 9887 Victoria-3d c.-6,055 lb. (301), 7th c. 6,623 $\frac{1}{2}$ lb. (315).

T7 records are comparatively late: 8239 Sunshine-3d c.-6,026 lb. (256); then 4-yr. av. 6,716.37 lb. (1,139). Her 14220 Salome, after 5,098 $\frac{1}{2}$ lb. (294), 3-yr. av., 7847.9 lb. (848); last record, 9,986 $\frac{1}{2}$ lb. (350). 22587 Gressenhall Saint 2d, 8,697 $\frac{1}{2}$ lb., and 22588 Gressenhall Saintly, 2-yr. av., 8026.75 lb., both 4th in descent from Salome.

T17 and T18 Families are descended from Messrs. Howell's herd at Great Walsingham, which dated from the later years of the Reeve breeding at Wighton and Walsingham. 8012 Maiden Belle-3d c.-6,849 $\frac{1}{2}$ lb., fat 3.6 (294). Her 15331 Maiden, 2-yr. av., 5753.87 lb. (582) 8772 Missie—T18-2d c.-5,217 lb. (330); then 4-yr. av., 6663.87 lb. (1,242). A gr.-dr. of Missie's dam, 17177 Mischievous-1st c.-7,069 lb. (288); 4-yr. av. from 3d c., 8056.62 lb. (1,242); highest record, 9,453 lb. (361). Her 20444 Majirascal-3d c.-8,603 $\frac{1}{2}$ lb. (364), 5th and 6th c. 8,369 $\frac{1}{2}$ lb. (344) and 10,990 $\frac{1}{2}$ lb. (353); 7th c. 9,078 $\frac{1}{2}$ (337), 8th c., 10437 lb. (305). Mischievous 2d's 18727 Mary, 3-yr. av., 7522.8 lb.

The U Group was allotted to the Red Polled in West Suffolk. Though comprising few Foundation Cows when the Herd Book was issued in 1874, there were many more added on the Register in the second part of Vol I. Mr. R. E. Loftt supposed they were a color variation of the old Suffolk cow, which used to be spoken of as the Suffolk dun—"a light yellow or pale ginger color." The modern origin of the "Red Polled" I have already set forth from published and personal facts of the early 19th century. We have the facts set down—in Friar Jocelyn's late 12th Century story of the life and doings of Abbot Samson, the head of the great St. Edmund's Monastery at

Bury, West Suffolk, a story which Thomas Carlyle made so entertaining in his "Past and Present," and now to be read in more than one recent version—that the Monastery held many manors in West Suffolk. Jocelyn's hero came as a youth from the Norfolk area that borders Northwest High Suffolk, with East Anglian ideals, and an invincible love for English speech, though it was decidedly vulgar, and English love of freedom in the country. It may be presumed that he favored the Suffolk dun cow rather than the White Polled, which were possibly to be found on Abbey and Priory farms in the "shires" and in some northern areas, and we are told that during his thirty years as Abbot he interested himself in the lands which he controlled, and which were of good quality. A few old-style Suffolk Duns were to be seen some thirty years ago. And we know that the Suffolk Polled of the 18th Century were of a larger type than most of those in Norfolk. So we may take it as probable that the West Suffolk polled were derived from the old time Suffolk Dun cow.

Records of U2 are all from descendants of 2766 Dot, which was bought by a Norfolk man at a Troston sale. Dot's 8430 Daffodil made its record at Saham-1st c., in 1894, 7,296 lb. (335). With 3d c. to 9th c., in 1902, the record ranged from 7,760 lb. (283) to 10,170 lb. (273); 7-yr. av., 8664.9 lb. (2,187). Her 9240 Daphne-1st c.-8,231 lb. (329), 3d c., 9,167 lb. (263), 4th c. 8,956 lb. (307); 11117 Daffy-down-dilly, a 5-yr. av., 8591.8 lb., fat 4.1 (1,613), and then 8th c., 10,553½ lb. (323). 11116 Daffodil 2d, a full sister of 11117, had a 2-yr. av., 7242.75 lb. (611). Her 18732 Meadow Dell, 4-yr. av., 8184.5 lb.; then 5th c. 10,707 lb. The last of Daffodil's progeny recording: 16925 Kitchener's Daffodil-1st c.-8,543½ lb. (333), 3d c. 10,215 lb., fat 5.0 (331), and then to the 31st September, 1915, a 10-yr. av., 9032.25 lb. Daphne's 15229 Magic-1st c.-8,799 lb. (418), then 2-yr. av., 8,162 lb., fat 4.1 (619); her 18983 Magic's Crown, 4-yr. av., 6809.37 lb. (1,279), then 2-yr. av., 9,112 lb. (662). Kitchener's Daffodil heifers have been in such demand that the only record to be quoted is 22668 Meadow Daffodil-1st c.- 5,477½ lb. (210), 2d c. 7,844 lb. (340) 3d c. 6,520 lb. (327).

Breed Analyses: Dot, N. 187.5, S. 785.93, RP. 26.56. Daffodil, N. 341.0, S. 459.42, RP. 199.57. Daffy-down-dilly, N. 491.98, S. 280.19, RP. 227.81.

The 29 U3 records have been made in diverse areas. The earliest, 5th in descent from 248 Handsome, 6412 Handsome 28th-7th c.-8,093 lb. (280). 10332 Handsome 35th (at Tring)-1st c.-10,025 lb. (388), then 5-yr. av., 7853.5 lb. (1,459); highest record, 9,847 lb. (322). 11316 Handsome 36th-3d c.-8,801 lb. (327), 6th c. 10,366 lb. (264), 7th c., 11,976 lb. (236). Handsome 35th's 19797 Hasty-1st c.-7,089 (561).

At Aspall, 5855 Posthorn, 14-yr. av., 6,776 lb.; highest record, 8,988 lb. (344). Her 12952 Sapphire-1st c.-5,592 lb.; then from 4th c., 8-yr. av., 9057.37 lb.; highest record, 10,582 lb. Posthorn's gr-dr., 12035 Blackbird-2d c.-8,098½ lb. (347), 5th c., 7,224 lb. Third in descent from Posthorn, 21535 Aspall Pomona-1st c.-6,208 lb., 3d to 5th c. av., 7382.33 lb., highest record, 7,988 lb. (313). Aspall Pomona's 22909 Aspall Applewoman-2d c.-6,895 lb. (318). Sapphire's 22433 Aspall Pansy, 3-yr. av., 7337.66 lb.

At Cheriton, Kent, fifth in descent from the Troston-bred 4575 Handsome 25th, 20678 Cheriton Lark-1st c.-5,121 lb. (203), then 4-yr. av., 6233.25 lb. (968). At Letton, Norfolk, 20870 Red Honey, 4-yr. av., 7789.34; highest record, 9,190¼ lb.

Two Troston-bred U5 were transferred to Mr. E. Cooke, Stalham, and thence to Whitlingham. 4149 Kate-1st c.- 7,630 lb. (365), followed by 14,451 $\frac{3}{4}$ lb. (624) and 10,407 lb., fat 4.4 (385); then 6-yr. av., 8,004 lb., fat 3.9 to 4.1 (1,865). Her 15190 Kate 2d-2d c.-12,545 $\frac{1}{2}$ lb. (413). 4375 Stalham-1st c.-8,131 $\frac{1}{2}$ lb. (383), 4th c. 15,641 lb. (661). 8th c. 10,217 $\frac{3}{4}$ lb., fat 3.5 (320); 5 other years' av., 7822.6 lb., fat 4.0 to 4.6 (1,818). Her gr.-dr., 8993 Spotless-2d c.-7,601 $\frac{1}{2}$ lb. (406), 3d c. 7,609 $\frac{1}{2}$ lb. (364). 9011 Susie—U5, at the 1901 Pan-American Exposition, gave of the Red Polled the largest yield of milk—6,430 lb. in 184 days, but was second in the butter test of the Red Polled lot with 287 lb. She was at the beginning of the test 54 days in milk, as was Mayflower 2d—A12.

[20499] Ruth, 8699.8 lb., fat 367.50. [22637] Alice B., 8238.3 lb., fat 341.92; 9389.5 lb., fat 363.81; 8314.9 lb., fat 328.51. [25356] Iowa Belle, 8650.65 lb., fat 337.19. [26705] Della, 6511.9 lb., fat 269.7. [30124] Leda, 8,413 lb., fat 375.34.

1823 Pink Domino—U6, 5-yr. av., 6777.2 lb. 19618 Banking—U6-1st c.-7,641 lb. (322), 2d c. 7,650 lb. (293), 5th c. 7,257 lb. (273), and 4-yr. av. 5737.2 lb. (856).

U9 Family was introduced into the Rendlesham herd by 10842 Trimley Pretty 5th-2d c.-9,377 lb. (600), 5th c. 8,219 lb. (309), and 11-yr. av., 6815.4 lb. (3,710). Her 18858 Rendlesham Pretty, 4-yr. av., 5,794 lb. (1,352), then 6th c. 8,755 lb. (261); 20534 Rendlesham Pretty 5th-1st c.-6,238 $\frac{1}{2}$ lb. (330); then 3-yr. av., 6,755 lb. (1,053); and 20896 Rendlesham Pyrrhic-1st c.-5,211 $\frac{1}{2}$ lb. (313); then 3-yr. av., 6242.8 lb. (1,017). 18965 Waxlight 2d-on another line of breeding 4-yr. av., 7203.6 lb. (1,137).

13231 Bo-Peep—U18 had an early record 2d c.-7,431 lb. (365); then 4-yr. av., 8066.37 lb. (1,047). 13245 Beryl, 3-yr. av., 6696.66 lb. (988).

U43, a late Troston selection, 15746 Ring-2d c.-7,020 $\frac{1}{2}$ lb. (287). 17985 Daisy, a gr.-dr. of Ring's dam, when 5-yr. old, 8,912 lb.; then 6,458 $\frac{3}{4}$ lb. and 9,375 $\frac{3}{4}$ lb. 18322 Stella-4th c.-7,387 lb. (280), 5th c. 7,402 lb. (292) and 8,169 lb. (322). Her 20684 Cheriton Stella-2d c.-9,770 lb. (329), then 3-yr. av., 6558.66 lb. (631); and 21107 Cheriton Steam-2d c.-6,388 lb. (238), then 2-yr. av. 6,881 lb. (497).

Of the East Suffolk contingent's records there are 44 of V1 Family, which was in Mr. G. Gooderham's herd at Monewden, well established before 1860. The earliest record is 6010 Sunny Risky-6th c.-9,591 lb. (388), 7th c. 6,162 lb. (361). From the same dam 3824 Wild Risky, 7537 Sound Risky, 2-yr. av., 6791.5 lb. 3824's gr.-dr., 19548 Sunny Cheriton-1st c.-6,914 lb. (304), then 4-yr. av., 7208.75 lb. (1,143). 19548's 20685 Cheriton Sun-2d c.-9,059 lbs. (406), and 21108 Cheriton Sunbeam-1st c.-10,663 lb. (460), then 3-yr. av., 6743.66 lb. (859). 20685's 22513 Cheriton Sunflower-2d c.-7,200 lb. (353).

3217 Wild Ruth's 7568 Sweet Ruth, 3-yr. av., 6,813 lb. (847), then 10,665 lb. (333). Her 10516 Miss Ruth-1st c.- 10,414 lb. (469). On another line of breeding, 19209 Flaxmoor Ruby, as a 5-yr. old, began a record at Saham with 8,062 lb. (203), and in years immediately following 11,849 lb. (339), 11,885 lb. (344), 13,268 $\frac{1}{2}$ lb. (337) 14,533 lb. (336), 11,757 lb. (331), and in 1914-15 12,402 lb. (340). Her 23118 Meadow Rubicon-1st c.-7,144 lb. (365), 8,029 (331). Breed Analysis: Flaxmoor Ruby, N. 540.00, S. 213.81 RP. 246.15.

Also, with a large infusion of Norfolk blood: 20349 Fustian 2d, 9-yr.-old record, 8,336 lb. (286); her 22875 Velveteen-2d c.-7,973 $\frac{3}{4}$ lb. (328), and 23824 Winey-1st c.-8,137 lb. (333 days of 1915).

7867 Flora 4th—V2-4th c.-7,740 lb. (337), 5th c. 9,813 lb. (329),

7th c. 8,335 lb. (233) 8th c. 8,473 lb. (364). An American record, 13006 Sue 2d—V2, 6712.4 lb., fat 258.78.

8248 Tamer—V5-2d c.-6,070 lb. (323), then 3-yr. av., 7663.5 lb. Her 20901 Rendlesham Tamer, 3-yr. av., 7204.8 lb. (929).

Three Gleham Families recorded at Whitlingham: 2213 Gleaner V9, the earliest record of milk in this family; 10th c. 14,184 lb. (365), but as she had calved down on Nov. 3d of the previous year, the record was possibly over 16,000 lb. for 424 days; after that 11th c.: the best milk record yet made in East Anglia. 3469 Gleaner—V9-1st c.-8,630½ lb. (290), 2d c. 9,521¼ lb. (314), 4th c. 9,078 lb. (328), with 3 other year av., 8,153 lb. (976), the remaining 4 years varying between 6,657 lb. and 6,376¾ lb. Her 9379 The Gleaner-1st c.-6,918½ lb., fat 3.9 (420); 11277 Geneva-1st c.-6,577½ lb. (305), 2d c. 7,988¾ lb. (366); and its 16698 Geneva 2d-2d c.-6,801¼ lb. (351). Third in descent from 3469, 18642 Gleaner 4th-2d c.-6,235¾ lb., 7,953½ lb., 6,295¾ lb.; 5th c. 8,613 lb. Other Gleaners: 8751 Miss Gloss-2d c.-5,132 lb., fat 3.6 (339); 5,592 lb. (246). 12667 Miss Glaze, 5-yr. av., 6,313 lb. (1,669).

Four American V9 records are from daughters of the same cow [18469] Lady Jane, which traced back through 2847 Glow-worm to Harpley, where Mr. J. M. Spinks set up a herd direct from Gleham and supplied Whitlingham. [26136] J. D. L. Jane, 5,587 lb., fat 213.42; 4,444 lb., 8318.4 lb., fat 314.05. [26748] Lady Jeanie, 7521.5 lb., fat 305.19 (328); 5550.6 lb., fat 213.06 (309); 8456.2 lb., fat 326.15; 9858.7 lb., fat 392.24; 12353.4 lb., fat 420.19. [27543] J.D. L. Jane 2d, 5788.0 lb., fat 249.6; 5,516 lb., fat 231.7; 5,742.2 lb.; fat 234.47; 9,874 lb., fat 413.16. [30174] J. D. L. Jeanette, 5606.4 lb., fat 208.21 (306); 6761.3 lb., fat 257.48. [30847] Honingham Claret, 7025.38 lb., fat 299.69.

Of V11 Family, 3674 Proof, 4-yr. av., 7,295 lb., fat 3.0 (1,253). Her 4673 Peggy-1st c.-7,430¼ lb. (382), and its 5821 Palm-3d c.-5,323 lb. (386), 4th c. 7,374½ lb., fat 4.0 (301). Of 2461 Press, the dam of Proof, 5046 Pallas, 3-yr. av. from 5th c., 7,382 lb., fat 4.1 (974). A gr.-dr. of 2461, 8124 Prioreess 2d, 6-yr. av., 6,563 lb., fat 3.7 (1,718); highest record, 7,598¾ lb. (305). Her 15607 Plessy-1st c., 20th September, 1902, with 14 days interval and 2d c., milked to 19th December, 1903, giving 10,129¾ lb. in her last 354 days. Yet another line from Gloss 2d, the Harpley original: 18224 Playmate-1st c.-6,809 lb. (412), then 3-yr. av., 6779.66 lb. (859); and from 18212 Patience, Playmate's d., 19963 Passion-1st c.-8,054 lb. (365), 7,753 lb. (284), 6,930 lb. (291). From Playmate 19968 Playful-2d c.-6,385 lb. (347). And from Prioreess 2d 19371 Pin-1st c.-6,903¾ lb., then 3-yr. av., 6,905 lb. (950).

American records trace to Harpley through another line of breeding to 2844 Gloss 7th—V11. [18085] Cora, 10763.75 lb., fat 430.5; [19840] June, 8923.8 lb., fat 382.32; and [28209] Julia, 6,679 lb., fat 264.73. On the line from 1070 Penguin—V11 [23187] Peaceful 7818.5 lb., fat 326.78 (267); and [30100] Lily, 7547.7 lb., fat 260.68.

Of V13 Family, 3462 Gardenia, 2-yr. av., 8236 lb. (731). 7493 Ruby-3d c.-6,285 lb. (302), then 3-yr. av., 6200.33 lb. (866); its 9742 Keenah-1st c.-6,522 lb. (350), 2d c. 6,243 lb. (329), and 3d in descent from Ruby, 16704 Gipsy of Johnstown-1st c.-6,201 lb. (315).

American V13 records: [18086] Cora, 10763.5 lb., fat 430.5. [22818] Red Bud, 8472.9 lb., fat 355.84; 8755.7 lb., fat 387.26. [27766] Lady, 10,049 lb., fat 328.20. [34037] Violet, 7574.8 lb., fat 328.20; 8714.2 lb., fat 373.70.

The Gleham V14 Family records open with 3819 Wilby Lass, 5th to 7th c., 3-yr. av., 6781.5 lb. (868); and 4438 Wilby, both gr.-drs. of 921 Gleham Rose. Wilby's 1st c., 8,544 $\frac{3}{4}$ lb. (380). 10894 Wilby 3d-1st and 2d c.-8,360 $\frac{1}{2}$ lb., fat 4.1 (419). On another line of breeding: 12773 Pearl, 2-yr. av., 8,309 lb. (528). 19287 Lady Molly, 5 calves, 4-yr. av., 6,165 lb. (1,033). 20826 Lady M.-2d c.-7,654 $\frac{1}{2}$ lb. (348).

In 1900 Lord Radnor added to his recently established herd at Longford Castle all the V17 Red Polled which were in Mr. W. E. Long's herd at Hurts Hall, Saxmundham, tracing back to 4952 Honey Bee, gr.-dr. of 950 Honey. The earliest records—all in 1903, 8601 Honey-maid 7th c.-7758 lb. (289), 10815 Sweet as Honey-7th c.-8,921 lb. (339), and 13120 Young Honey Bee-5th c.-10,779 lb. (356), then 8,238 lb. (332), 10,258 lb. (329), 7,503 lb. (318). 16729 Golden Thistle-1st c. in 1904-7,263 lb. (294), then 7-yr. av., 8496.33 lb. (2,624); top record-3d c.-9,559 lb. (301). 16732 Goldy Locks, also in 1904, yet in the herd, and is the most noteworthy-1st c.-7,517 lb. (322) 2d c. 9,982 lb. (328), then 7-yr. av., 9156.42 lb. (2,161); 10th c.-in 1913-11,076 lb. (364), 11th c. 9,844 lb. (326), 12th c. 7,280 lb. (276). Six of her progeny have records: 19434 Red Duchess-1st c. 6,967 lb. (327); 20366 Graceful, 6-yr. av., 7,194 lb. (1,853); 20777 Locket-2d c.-8,001 lb. (228), 3d c. 7,033 lb. (364), 5th c. 8,708 lb. (313), 6th c. 8,352 lb. (338); 21723 Longford Odalisque, 5-yr. av., 7508.8 lb. (1,505); 22658 Longford Attraction, 2-yr. av., 7744.5 lb. (648), 3d c., in 1915, 8,828 lb. (346); 22171 Longford Demet-3d c.-9,335 lb. (331), 4th c. 9,914 lb. (315), 5th c., in 1915, 10,394 lb. (332).

10815's 16814 Honeysuckle-2d c.-6,860 lb. (343); 18960 Unity, 11-yr. av., 6425.27 lb. (3,260); 18960's 22661 Longford Magic, 15,870 lb. (679), and 23084 Longford Jollity-2d c. August 11th, 1915-9,351 lb. (329). Locket's 22172 Longford Diamond, 2-yr. av., 7722.5 lb. (623), then in 1915 9,244 lb. (327).

Breed Analyses: 4952 Honey Bee, N. 158.50, S. 750, RP. 91.40, 13562 Golden Bee, N. 290.28, S. 552.57, RP. 157.15. 16732 Goldy Locks, N. 297.04, S. 528.35, RP. 174.58.

V23, a selection from High Suffolk, gr.-drs. of 4105 Basketon Lady: 8643 Lady Bow-1st c.-8,093 lb. (352), then 7-yr. av., 7051.28 lb. (2,146). 11411 Ladybird 3d-5th c.-9,639 lb. (316), 6th c. 9,579 $\frac{1}{2}$ (343), then 3-yr. av., 7,851 lb. (893). Third in descent, 11425 Lady-like 2d-2d c.-8,596 lb. (345); dry 18 days, then 6,878 lb. (282); 7,904 lb. (334), 9,784 lb. (339), and 8,460 lb. (364).

The elder Mr. Samuel Wolton, farming the Butley Abbey lands, some four miles from the East Suffolk coast—a wealthy area, that for 400 years appertained to an Augustinian Priory—began with a Short-horn herd. In 1848 he bought his first Red Polled, whose progeny competed at the 1862 (Battersea) R. A. S. E. Two other selections, W2 and W3 were added, and gave the herd a good repute. A few others were bought of which no register was kept. Of these last there are records of five families only.

Of records of W1, the earliest is 7665 Battersea Princess 4th c.-8,210 lb. (332), 5th c. 8,206 lb. (252), then 6-yr. av., 7781.33 lb. (1,632). Her 9976 Battersea 5th-1st c.-6,478 lb. (363), 7,293 lb. (289); 10955 Battersea Princess 5th, 8-yr. av., 7155.5 lb. (2,512); 16153 Battersea Princess 6th-1st c.-5,946 lb. (484). 9976's [23618] Battersea 8th, 8208.2 lb., fat 412.48.

The 40 records of W2 include many made at Whitlingham, and some in America, tracing back to that Norfolk area. The earliest,

1317 8th Belle of Suffolk, bred by Samuel Wolton, of Butley, who succeeded his father in 1873. When 12-yr.-old her record 9,573½ lb. (357), then 4-yr. av., 6,306 lb., fat 3.1 to 4.00 (1,267). 5207 Bangle Belle, dr. of 1316 7th Belle of Suffolk-1st c.-5,965½ lb. (378), 4th to 7th c., av. 6031.76 lb., fat 4.1 to 4.6½ (1,190). Gr.-dr. of 5207, 5511 Hair Belle 2d-1st c.-5,965½ lb. (378), 2d c. 9,879 lb. (512), then 4-yr. av., 7999.6 lb., fat 3.2 to 3.4 (1,379). Her 13591 Hannah, 4-yr. av., 8,703 lb. (1,329). Bangle Belle's 4th c., 10507 Miss Belle-1st c.-5,037 lb. (300), then 3-yr. av., 6,935 lb. (920); 5th c. 11003 Bona, 8-yr., av., 6210.7 lb. (2,563).

Dam 3254 13th Belle of Suffolk's 6185 14th Belle of Suffolk made all her records at Whitlingham, 2d c. 10,224¾ lb. (660), 3d c. 8,724½ lb., fat 3.8 (330), 5th c. 9,186¾ lb. (343); then 3-yr. av., 6,563 lb. (1,017). Her 8357 Blanche-2d c.-6,148¾ lb., fat 3.5 (343); 10803 Suffolk, 3-yr. av., 5,358 lb. (774); and 12078 Brisk, which-1st c.-milked 713 days; total yield, 12,765½ lb.; then dry 63 days and 2d c. 7,225½ lb. (294); on grass feed alone, 5,079½ lb. (182); 3d c. 8,458 lb. (350), dry 19 days. Suffolk's 17666 Silex-1st c.-10,201½ lb. (416).

Third in descent from 59 Bridesmaid—W2, 4292 Pretty Bride-4th c.-8,585¾ lb., fat 3.4 (308). Her 7720 Bridecake-1st c.-6,841½ lb., fat 3.5 (350); 2d c. 7,720 lb. (294).

Breed Analyses: 7th Belle of Suffolk, N. 187.5, S. 612.5 RP. 200. Bangle Belle, N. 266.01, S. 446.87, RP. 287.10. Miss Belle, N. 379.88, S. 280.15, RP. 359.95. Bona, N. 424.50, S. 246.28, RP. 329.19.

The W2 American records are a most noteworthy lot. They carry us back by many generations to 41 Belle of Suffolk—W2, through 611 Topsy, which was transferred from the Wolton to the Stoke herd. Her gr.-dr., 1251 Water Fairy was next in Mr. J. J. Colman's Easton herd. 1943 Winsome, daughter of Water Fairy by Grey Spot 498, when 2-yr.-old was bought at Whitlingham for the Mead and Kimball importation of 1882. Romeo 741, which was bought at the same time, covered Winsome, and thus 5740 Minnie was got. Then the next two generations were sired by Commodore 1151, a son of Charles Martel, whose dam, 1133 Rosa—P3, was also the dam of Romeo. From this point the stock on both sides of Bessie's pedigree were American bred, with [17976] Bessie sixth in descent from Winsome. Bessie's record was 5706.2 lb., fat 267.1 (303). Her progeny's records: [26174] J. D. L. Bessie, 8385.9 lb., fat 375.46; [31725] J. D. L. Beauty (the highest return yet published)-1st c.-10,019.8 lb., fat 442.95, 3d c. 20,230.6 lb., fat 891.58; J. D. L. Buto-1st c.-8629.1 lb., fat 437.89. [26174's] [30173] J. D. L. Beatrice, 7783.8 lb., fat 321.52 [34865] J. D. L. Brunette-1st c.-8613.4 lb., fat 404.67.

Breed Analyses: Winsome, N. 305.46, S. 184.17, RP. 510.35. Bessie, N. 460.68, S. 268.11, RP. 265.16. J. D. L. Beauty, N. 478.24, S. 180.82, RP. 339.32.

Of 107 W3 records, those are selected that best illustrate the several lines in which the mating has been diverse. Whitlingham added the best of the Wolton breeding in 1891.

Of the 375 Nelly type: 2018 Betsy-6th c.-8,943½ lb. (336), then 3-yr. av., 8282.33 lb., fat 3.1 to 4.3 (1,051); last calf, 7,458 lb. (247). 3501 Helena, 6-yr.-old, 8,697¾ lb. (315); then 6-yr. av., 7,673.7 lb., fat 3.6 (1,443). 15248 Lena 3d-1st c.-6,418 lb. (315); then 2-yr. av., 5327.5 lb. (544). 13916 Miss Betsy-3d c.-7,870 lb. (329), 6th to 8th c., 3-yr. av., 9080.7 lb. (1015). 13315 Clarissa, which began her record at Whitlingham and carried it on in Lord Rothchild's herd, came into the 375 Nelly series through her dam, 6240 Chrissy, transferred

from Mr. B. Stimpson's herd. Clarissa's-1st c.-8,382 $\frac{1}{4}$ lb. (357), 2d c. 6,779 $\frac{1}{2}$ lb. (315), 9,547 $\frac{3}{4}$ lb. (359), 7,161 $\frac{1}{2}$ lb., 5th c., February 9th to March 23d, 1905, not recorded; 8,024 lb. to September 30th; 6th c. May 9th, 1906, 11,118 lb. (322); 7th and 8th c. (twin), 12,005 lb.

Breed Analyses: Chrissy, N. 531.44, S. 177.42, RP. 291.11. Clar- (303); 9th c. 12,577 lb. (328).

Clarissa, N. 541.54, S. 122.88, RP. 335.52.

18179 Mona, which came into the Nelly series through Mr. Horace Wolton's 3610 Newbourn Nelly, had, up to December 31st, 1915, made in the Longford Castle herd the heaviest continuous record of any Red Polled in the United Kingdom. Her record opened with 1,306 lb. (35), then, from November 1st, 1905, it proceeds year by year —10,487 lb. (351), 8,083 lb. (318), 11,214 lb. (331), 10,193 lb. (299). 13,637 lb. (307), 14,713 lb. (364); 6th c. on August 17th, 1910—and milked to March 5th, 1912—from August 27th, 6,095 lb. (192), 12,958 (361), 10,702 lb. (303), 11,883 lb. (314); total of 10 yrs. 5 wks., 111,276 lb. in 3,175 days. Competing at the London Dairy Show in October, 1910, when she had been in milk after 6th c. 49 days, gave 64.6 lb. as the two mornings' yield, 54.6 lb. the evenings'; fat percentage, 4.88 and 5.14; solids, 13.84 and 15.9; total points, 120.0.

The dam of Mona, 17171 Minnie, record began in Lord Radnor's herd with 3d c., 10,548 lb. (338), and then 7,277 lb. (357), 8,579 $\frac{1}{2}$ lb. (318), 8,899 lb. (322), 8,512 lb. (331). Her 18271 Jane-1st c.-9,271 $\frac{1}{2}$ lb. (348), 2d c. 5,869 lb. (300), then 5-yr. av., 7378.4 lb. (1,442). Her 21722 Longford Minerva, 3-yr. av., 8,316 lb. (944). (Mona's 1st c., 24216 Longford Nomad began her record on July 27th, 1915.

Breed Analyses: Minnie, N. 463.76, S. 301.83, RP. 244.38. Mona, N. 444.36, S. 282.45, RP. 273.14.

Of the 565 Starry type: 3579 Star, 14-yr.-old, 10,416 lb., fat 3.5 (343); 6,725 lb. (336), 9,391 $\frac{1}{4}$ lb. (308). 3762 Starry 3d-5th c.-7,487 lb. (274), 7th c. 7,447 lb. (335), 8th c. 6,570 lb. (350). Her 5143 Starry 4th-3d c.-7,688 lb. (343) then 4-yr. av., 7733.25 lb. (1,307). 2591 Venus 2d, 10-yr.-old, 10,216 $\frac{3}{4}$ lb., fat 3.0 (364); then 8,548 lb., fat 4.3 (357); and 4-yr. av., 6,729 lb. (1258). 9842 Starry 8th-1st c.-6,243 lb. (330), 3d c. 9,764 lb. (336). Venus 2d's 9055 Venusa-3d c.-11,171 lb. (647). Starry 4th's gr.-dr., 18318 Starry Child, 2-yr. av., 5,734 lb., fat 4.0 (606).

383 Newbourn Pride, a daughter of 375 Nelly, was, in 1873, transferred from Butley Abbey to Troston, and there had a long array of descendants. The earliest record is that of 5733 Mingle, gr.-dr. of 1708 Newbourn Pride 7th, 7-yr. av., 6997.6 lb., highest record, 8,420 $\frac{3}{4}$ lb. (347). Mingle's 8739 Minx, 14-yr. av., 7,804 lb. (4,624); highest records, 10th c. 10,541 lb. (343), 11th c. 9,062 $\frac{1}{2}$ lb. (353). Her 13784 Little Minx, 6th to 10th c., 5-yr. av., 7072.5 lb. (1,609). Little Minx's 20532 Rendlesham Minx 2d-1st c.-5,051 $\frac{1}{2}$ lb. (295), then 3-yr. av., 5,039 lb. (977); and 18628 Fraser's Folly-2d c.-8,102 $\frac{1}{2}$ lb. (358); then 5-yr. av., 8064.6 lb. (1,447). Fourth in descent from Newbourn Pride 7th, 15422 Mindful 2d-1st c.-7,703 lb. (450).

Mingle's 10494 Minnesota-1st c.-9,861 $\frac{1}{2}$ lb. (656). Fourth in descent from 1051 Newbourn Pride 4th, 8371 Brandeston Maid 4th to 6th c., 3-yr. av., 8010.5 lb. Her 11009 Brandeston Maiden, 2-yr. av., 7,301 lb. (695), and 16379 Comely Maid-1st c.-5,371 lb. (250), then 2-yr. av., 7,048 lb. (662). Third in descent from 3024 Newbourn Pride 12th, 17981 Daffodil, 6th to 8th c., 3-yr. av., 7434.66 lb. (856). Her 20676 Cheriton Daffodil-1st c.-9,098 lb. (415), 5th c., in 1914, 8,170 lb. (312).

Of W9, the only worthy record is that of 6480 Lady's Slave-1st c.-7,024 lb. (266), then 5-yr. av., 8,253 lb. (1,520); highest record-5th c.-10,490 lb. (306).

W10 records were opened at Tring. 6224 Butter-board-2d c.-12,293 lb. (320). From the same dam, 4482 Buttercup; 7724 Butter-print-1st c.-6,399 lb. (224); then 3-yr. av., 7692.66 lb. (975). Butter-board's 7725 Butterscotch-1st c.-11,131 lb. (682), then 5,837 lb. (280). Her 12389 Hasto Butterscotch, 15,961 lb. (764). Second in descent from Butter-board, 12271 Grace Darling, 7,502½ lb. (388); then 8,594¾ lb. (294). 14504 Butterboard 2d, 3-yr. av., 6703.66 lb. (989). Butterprint's 11041 Buttermaid-1st c.-6,846 lb. (378).

2037 Bracelet—W14, in the Easton Park herd-3d c.-9,283 lb. (323). 2208 The Gem-4th c.-9,363½ lb. (277). 4719 Snowball—W15, 7-yr. av., 6,489 lb. Her 10711 Snowdrift, 9-yr. av., 6984.26 lb. (2,734); highest record, 9,381 lb. (298). Snowdrift's 14263 Snowdrop-1st c.-4,978 lb. (245), then 4-yr. av., 8445.37 lb. (1,289); and 17678 Snowflake 1st, 6,977½ lb. (315) then 8,716 lb. (290), 8,348½ lb. (333). Snowdrop's 20031 Rendlesham Snowdrop, 4-yr. av., 5,929 lb. (321) 5th c., 6,749½ lb. (330); and 21323 Red Gal-3d c.-5,965 lb. (260), 7,164 lb. (335).

The name Pond was only a memory some years after the Red Polled had their register. But in the spring of the year 1882 Mr. Wm. Bradfield, of Elmham, told me he had acquired two Pond cows. He accompanied me to the farm at Castle Rising, where there were a few others. A Mr. J. Rivett had taken over from an old Mr. Wiffen, of Tittleshall, Ben Pond's highly valued cows, and we found on the steading a 6-yr. old cow, 2450 Polly, and three 2-yr.-old heifers. The owner had intended to fatten them, but Mr. Fulcher lost no time in recovery of the lot, and after much diplomacy also secured from Rivett the bull Falstaff 303, which some six or seven years before had been bred by the Rector of Elmham. Falstaff, after doing good service in Norfolk, was shipped to Mr. G. K. Taber at Pawling, New York.

Whitlingham made all the early milk records of the Pond 1 Norf. Group. 2437 Poppy, 8-yr. old., 6,636½ lb. (270); then 7,149¾ lb. (251), and after 2 years, her last record, 8,488½ lb. (259). Poppy's daughter's records varied between 3,000 lb. and 7,500 lb. in the year's yield. 5852 Pop 2d-4th c.-9,402½ lb., fat 5.2 (343). Pop 2d's 7412 Polly-3d c.-8,224 lb. (343), and her 10619 Perfidy. 7-yr. av., 6421.83 lb. (2,095), within two years record a long carrying over of the yield after calving. Pop 2d's 12830 Purity gave a more steady record: 6-yr. av., 6209.16 lb. (1,976), a result that possibly was in large measure due to the sire Red Prince 2902. Perfidy's 19398 Perquisite-1st c.-6,866 lb. (306), 2d c. 5,986 lb. (329); and 19966 Perish-1st c.-6,909 lb. (301), then a 4-yr. av., 8200.25 lb. (1,210). 12470 Jenny Jones, third in descent from the cow Polly, which Mr. Fulcher bought, had a 2-yr. av., 7,373 lb. Her*18117 Joyful 4th and 5th c.-16,048 lb. (679); and 18683 Judith 4-yr. av., 7782.67 lb. Judith's 20423 Judith 2d, 4-yr. av., 7975.9 lb., highest record, 9,782½ lb. Fifth in descent from 2606 Wiffin Cherry, which Mr. Bradfield had bought of Rivett, 17388 Pon-dicherry-1st c.-8947¾ lb. (252); then after 14 days dry, 8,364½ lb. (350).

American Records: 8796 Nonesuch, 16-yr.-old, 8500.4 lb., fat 295.18 (354). Her gr. dr. [26710] Nina, 9638.5 lb., fat 394.14 (340); 10723.6 lb., fat 465.45. [31471] Nonie, 7952.4 lb., fat 262.47.

Breed Analyses: Nonesuch, N. 577.71, S. 8587, RP. 336.39. Nina, N. 533.88, S. 133.75, RP. 332.11.

2 Norf Group had its origin in a Norfolk Polled herd, the care of the Mann family, at Great Ellingham, from the early years of the 19th century, with, in 1863, an infusion of the Elmham blood. Mr. F. J. Mann kept no milk record, but these are available from 1895, by 4183 Margery Daw, 2-yr. av., 5,780 lb. (453). Her 7921 Lady Copley, 3d and 4th c. av., 6,707 lb. (646). 8968 Martha-5th c., with 6th c. on December 11th-6,871 lb. (263), and 6,725 lb. (287). 9581 Miss Betsy, 4th to 6th c. av., 7206.75 lb. (979). 10644 Madrigal-2d c.-5,660 lb. (364). 21752 Miss Rosamond, 2-yr. av., 7,158 lb.

5 Norf., Now in America: [22714] Helen, 8140.8 lb., fat 349.31 7402.8 lb., fat 303.48. [24230] Hilda, 7509.4 lb., fat 280.92; 7723.5 lb. (315). 22392 Violet 2d-1st c.-8,306½ lb. (322), then 3-yr. av.,

A new Norfolk Group has been bred at Gressenhall by Mr. John E. Hill with the four generations the get of registered sires as the foundation. 22075 Daisy 2d, 10,027½ lb. (257), and 9,708½ lb., fat 3.3. Her 22076 Daisy 3d-2d c.-8,012 lb. (353), then 4-yr. av., 7,303 lb., fat 4.5. 22222 Poley 6th-3d c.-11,412¾ lb., fat 3.5. 22055 Cherry 3d 11,518½ lb. (384); then 3-yr. av., 9,064 lb., fat 4.1, and in 1915, 9,550½ lb. (347). 22124 Guist 6th-1st c. 6,011½ lb. (385), then 3-yr. av., 8597.8 lb., fat 3.5; followed in 1914-5th c.-11,424½ lb., and 8,626½ lb. (365) in 1915. 22223 Poppy 6th, 10,847½ lb. (355), 7,411 lb. (337), 11,412½ lb., fat 3.5, 12,923½ lb. in 1914, 13,449 lb., and then 7,437½ lb. (315). 22392 Violet 2d-1st c.-8,306½ lb. (322), the 3-yr. av., 7129.9 lb., and in 1914, 10,155¾ lb., 9,214¼ lb. (275) in 1915. Eight other young cows have recorded in the last two years, all alike full of promise for this latest trial of careful breeding by registered sires, from selected Norfolk Red Polled unregistered cows.

The Suffolk Groups, which began to register in 1883, include some lines of breeding that characterized families registered in the previous three issues of the Herd Book. 4217 Miss Barney—1 Suff., gr.-dr. of Mr. Gooderham's selection, 4-yr. av., 4,608 lb., fat 3.7 to 4.5 (1,031). Fourth in descent from her 10959 Miss Barney-1st c.-11,887 lb. (672). Her 19007 Beautiful Barn-1st c.-6,848 lb. (322), then 4-yr. av., 7917.75 lb. (1,164); and 7th c., in 1914, 8,145 lb. (302).

2 Suff. takes the name of E. Boon, a Brandeston farmer, who for over twenty years bred true to the Red Polled type. There are 53 records.

Mrs. J. F. Chevallier, who carried on the enquiring and careful work which the Mrs. Chevallier, of the closing years of the 18th century, carried through, as reported by Arthur Young, added to the Aspall Hall herd, in 1890, two cows from the Boon herd. The progeny are yet in the Aspall herd. The older of the two, 2252 Hester, in her 14th year in the herd, gave birth to her 18th c. Her record as an 8-yr.-old was 7,078 lb. (292); her 9th to 11th c. av., 7496.83 lb. (937), with other 6-yr. av., 6652.66 lb., the last year of which was 7,517 lb. The other introduction into the herd, 2867 Hannah, began as 6-yr.-old, 6878 lb. (373), then 11,577½ lb. (436), 8,446¼ lb. (283), 6,147½ lb. (283), and 4,909 lb. (310).

Hester's 7518 Shepherdess, 2-yr. av., 4,321 lb. (686); 8244 Sweet-as-Honey-3d c.-5,346 lb. (344), then 2-yr. av., 4761.5 lb., followed by 7-yr. av., 7880.5 lb. 9127 Beehive-1st c.-6,660 lb. and 7,084 lb., then 8-yr. av., 9396.3 lb. 11219 Fair Hester, 1st and 2d c.-15,685½ lb.; then 10-yr. av., 7,815 lb., of which two years were-5th c.-9,043 lb., 8th c. 9,059 lb. 12961 Shepherdess, 3-yr. av., 7907.66 lb. 14241 Shepherdess 2d, 6,754 lb., and Hester's 17th c., 15534 New Hester, 2-yr. av., 5,375 lb.: a noteworthy record of one cow's life!

12961 Shepherdess' 18201 New Shepherdess-2d c.-7,358½ lb., and 19072 Cassia 2d-1st c.-5,950 lb., then 8,058½ lb., 8,687 lb., 10,458 lb., 10,968 lb., 9,856 lb., 9,318 lb., 10,829 lb., 10,098 lb. (346). Cassia's 22436 Aspall Psyche-1st c.-6,624 lb. 7,981 lb. (281), and in 1915, 8,777 lb. (320). Beehive's gr.-drs., 21533 Aspall Pearmain, 5-yr. av., 8923.-6 lb.; highest record, 9,881 lb.; 21987 Aspall Pearmain 3d, 6989.5 lb. New Shepherdess' gr.-drs., 21536 Aspall Princess, 4-yr. av., 6,086 lb.; and 21537 Aspall Princess 2d-2d c.-7,048 lb., and 3-yr. av., 6,114.33 lb. Sweet-as-Honey's 17291 Noisette 2d, 5-yr. av., 7,341 lb., then 9,750 lb., 11,050 lb., 9,878 lb., 7,970 lb.

Breed Analyses: Hester, S. 975, RP. 25. 12691 Shepherdess, N. 119.34, S. 795.16, RP. 8545. Cassia 2d, N. 190.35, S. 705.92, RP. 103.70.

4817 Charm—2 Suff., 11-yr.-old, 8,045 lb. (335). Her 6237 The Charmer-1st c.-5,792 lb. (217), 6,168 lb. (308), 9,424 lb. (350). The Charmer's 8316 Ashlyns Charmer-1st c.-8,763½ lb. (294), then 2-yr. av., 8,344 lb. (651). Her 16123 Ashlyns-1st c.-6,158 lb. (395). Third in descent from 8316, 21257 May, 4-yr. av., 7,502 lb. (1,282).

7346 Moth—2 Suff.-1st c.-September 30th, 1893, to 31st December, 1894, 11,213 lb. (415); then 9,743 lb. (324), to 10,210 lb. (315), 13,468 lb. (343). Her 11321 Hastoe Butterfly-2d c.-7,670 lb. (318). 11321's Birthright, 5,774 lb. (375), 5,516 lb. (326).

4349 Sappho—4 Suff., 5 to 8-yr.-old, av., 7633.33 lb.; then 11,580 lb. (428), 7,720 lb. (237), 9,716 lb. (355). Her 6804 Susan-1st c.-6,618½ lb. (279); 4th c. 9,427 lb. Susan's 9146 Bessie-1st c.-5,441 lb., then 3-yr. av., 6109.5 lb., and subsequent 3-yr. total, 25,112 lb. Bessie's 1426 Sabina, 3-yr. av., 6,204 lb.

4918 Frump—6 Suff., 4-yr. av., 8684.24 lb. Her 7880 Fuchsia, 6,783 lb. (650).

11878 Tassel—9 Suff., 3d to 9th c., 7-yr. av., 7,466.35 lb. (2,281); then 10th c. 9,239½ lb. (265) 11th c. 10,205½ lb. (322). Her 18256 Rendlesham Tasty-1st c.-5,899 lb. (353).

DEVELOPED QUALITIES

In selecting the Milk Records which would be a sure foundation for a demonstration of Progressive Inheritance, it has been the rule to transcribe those of the earliest published yearly returns which had given the best results, the date of the records usually corresponding. The array of figures, which may, as a whole be of interest to the student of eugenics, will be seen to be only a fraction of the material available. The breeder of the Red Polled will find that the family he has in his herd has its representatives, and it may be that he will thence get something that will be helpful to him. This I will say, as neither breeder nor owner, that forty years' study of the evolution of a new British breed of "dual purpose" cattle has been a pleasant relaxation to the journalist. I hope the labour that ends it will be serviceable to hundreds of folk on both sides the Atlantic.

The published milk records in England have been set down in the Herd Book for each year in succession since the autumn of 1890. The student of my transcript will recognize that where the first calf's record is mentioned it represents the heifer's yield from the date of birth to the last day of the 365, which is the standard close of the year in that particular herd—the end of September, October, or December. That where my transcript begins with second calf the record includes part of the yield of the heifer after the birth of the first calf, the dry term of days, and the early portion of the yield after the birth of the second calf, and so on for each year named. Where there has been set down the average yield of a named number of years, the number of days of the milk yield period is within parentheses. The student is thus able to note how far the claim of the Red Polled to be "a great stayer" is borne out in that particular instance. It is a fact worth noting that there are in not a few herds instances of continuous milk yielding two or more years while giving birth to a calf each year. To name one instance only, Mr. R. Harvey Mason's 19220 Gemma—N4, whose record and breed analysis are set down in a previous page—From Jan. 1st of her 2d year, 1907, milked continuously, well into 1911, and then was dry 28 days only, while the year's total was 9,878 lbs. for 337 days. This quality of steadfastness has been the recommendation of the Red Polled to many a purchaser in all lands. It must also be noted that not a few of the cattle hold up the milk for some days after being shaken in a railway train, so that it is a fallacy to cite a day or even two days' testing in a show-yard as demonstration of the value of that particular cow. The fact has been known many a year. Proof may be read in the Herd Book of 1900 (Vol. 17 British edition, Vol. 12 American edition), in a report made to the then Secretary by Mr. A. D. Bruce, who had been Steward of the Norfolk Agricultural Association Show at Diss in 1899.

Steadfastness, which term may be honestly used as a characteristic of the present-day Red Polled, may be deemed to be a modern development of an inherent quality that had not been fostered. We have Arthur Young, in his "Minutes" dated January, 1786, protesting against certain High Suffolk practices.

These three points—(1) two-year-old bulls, (2) two-year-old cows, (3) not weaning their first calves—are fully sufficient to account for the smallness of the breed here. But it must be admitted, that if they can get as much milk from a small cow as from a large one, they are not for this to be condemned. . . . However we may condemn their management, upon these ideas of breeding, as exerted in the Midland Counties, where the greatest attention is paid to every circumstance; still, we must admit what cannot be denied, that they possess the best race of milkers that are known in this island: that their profits, considering the size of their cows, are equal, if not superior, to any known; and that in their food, and in the management of their dairies, I know nothing more perfect.

The talk at Wheycurd Hall by Young and Reeve cannot have been without full consideration of these particulars. John Reeve's first evidence of his new work was a bull two years old, which bull he again showed when four years old. Again, during 26 years he exercised his superior judgment in the selection of cows and bulls, which met his ideal of what was then termed the "general purpose" cow. The now generally adopted term had been used in the form "breeds claiming dual purpose character" in the report on the Pan-American Exposition drafted by Mr. J. McLain Smith, of Dayton, Ohio, for presentation to the "Red Polled Cattle Club" when it met at Chicago on December 4th, 1901. (The old-fashioned term has, by

an American journalists happy thought, when writing of the Red Polled in Kansas, as "The Farmer's Cow," given place to a much more compact and accurate description: "The Dual-Purpose Cow." It may truly be said the characteristic just named is a modern instance of evolution carefully thought out on lines corresponding with what we now know as the Mendel law. John Reeve could not fail to see that success depended on careful selection of the true dual-purpose blood-red polled cow—the "new breed," and a withdrawal of such of the progeny as were wholly of the Suffolk type, and those which were of the mixed type. It is a singular fact that a Devon schoolmaster, about the same time as John Reeve found the secret of hybridisation, also found it by the cultivation of a variety of the pea (as did the Brunn Augustinian Abbot, Gregor Johann Mendel, some fifty years later); but he did not bring it to perfection because he failed to cast aside growths that did not wholly fulfill the ideal "new type."

The many records of milk yield which have been published since 1886, and quoted in foregoing pages, show that there was, thirty years ago, much diversity in the detail of the number of days in the year's yield. That since there has been much attention paid to the production of milk after the birth of the first and second calves there is a much larger proportion of cows which milk steadily 300 days and over in the year. And that no small amount of the improvement is due to the judgment used in the choice of the sire for its dam's proven worth.

The old-time fault of a too early breeding of heifers is now well-nigh unknown. In its place we have much more attention paid to the young stock, so that the display of yearling and two-year-old Red Polled heifers at a show, and even on a farm, is "a thing of beauty," and, if owners and breeders be wise, also "a joy forever" to old and young folk. When opportunity serves, such stock live their natural life on a wealthy marsh, meadow, or park, so that when the first calf is born there is full life for it as well as for the dam. The evidence of this is seen in the dozens of records of a continuous yield of milk quoted in the essay. One such instance is found in the last record published at Whitlingham: 12078 Brisk—W2 extended its yield, after the birth of the first calf, to 713 days. After the heifer had 63 days rest, the second calf's birth was followed by a yield of 7,225 $\frac{1}{4}$ lb. milk in the remaining 294 days of the year, and a yield, after the third calf, of 8,458 lb. milk in 350 days of the 365 in that year. Her further history is not available since she was sold when the Red Polled stock had to be offered by public auction—the Norwich Town Council being required by governmental authorities to take possession of the farm. In many another instance the success of the practice of a prolonged milk period after the birth of the first calf cannot be determined, because the evidence was too strong to be resisted by the buyer of cows, breeders as well as dairy-men, who sought after "a good milker."

Another bit of similar Red Polled history given in an earlier page extends to the present time, and has its worth on both sides of the Atlantic ocean. The transcript of T. group records contains those of 2716 Coronet—T1, and some of her descendants. Coronet's first calf was born when a record of milk yield had not begun at

Whitlingham. Her 2d calf was born on April 23d, 1888; milk yield, 9,103 lb.; then on May 4th, 1889, her 3d calf. And she had given 12,253 lb. milk when, on May 25th, 1890, she was exported to America while yet her week's yield was 157 lb. The results of a test of her milk, taken on three consecutive days in 1888, when she was on grass feed only, will be set forth in the section of this essay which relates to butter production. 5367 Coronet 2d was Coronet's 3d calf, and was sired by Iago 1025. After her 2d calf and during part of the next year she was set apart for a special purpose, and as the milk was taken from the farm only a portion of each day's return was weighed and entered on the record sheets, to be copied into the carefully kept farm accounts. The record shows that she thenceforward gave a total yield of 29,956½ lb. milk in 1,461 days, with a 3.5 per cent butter fat content when on grass feed. Her maximum yield of milk, after 4th calf, 8,770¼ lb. in 354 days. This Coronet's 3d calf was Corporal 4313, whose sire was Red Prince 2902, and its dam a T1 cow. The record of 5367 Coronet 2d's 6th calf, 14723 Coronet 3d, sired by Redmond 5147, was: 1st c. 9,963¾ lb. yield in 539 days, then a 59 days' rest, and a further yield of 8,052½ lb., and one of 8,022½ lb., in the year 1904. Then she was sold. Her 4th calf was born on January 28th, 1905, and the milk record—after purchase and a railway journey to Tring Park—from April 12 to September 30, 1908, was 11,112 lb. in 632 days, followed by 8,378 lb. in 252 days after the 5th calf. The cow as is told in a previous page, is yet doing its part in Wexford County, and has there given birth to both bulls and heifers. To return to Coronet 2d's story, as shown by Corporal 4313. He was the sire in Wisconsin of [24888] Pear—K25, whose good record is given in a previous page, while her yet more noteworthy daughter [28991] J. D. L. Pear, has two successive years' record of 13160.6 lb. milk and 16598.4 lb. milk; for the two years, 1253.58 lb. butter fat, estimated butter 1566.97 lb. One of Corporal's sons—there are no fewer than 40 making a reputation in the United States—was Proctor Knott [12092], whose grandam, 1738 Polly 2d—E11, was bred by Mr. W. B. Easter at Stockton. This Proctor Knott sired [31725] J. D. L. Beauty—W2, which has won for herself a world-wide notoriety (the details are set out in the Butter Production section of this essay), and [31729] J. D. L. Latona B20, which has a year's record of 11053.6 lb. milk, 423.37 lb. butter fat.

On another line of E11 breeding, [40629], J. D. L. Purity—E11, which was born January 10, 1914, was junior champion at Montana State Fair in 1915. Her sire was Ruperta's Goods [19226], live weight 2,250 lb. J. D. L. Purity having dropped her first calf in April, 1916, began her Advanced Registry test; her live weight 1,230 lb. When four months in milk she entered contest at Janesville, Wisconsin, as two-year-old heifer, having then to her credit 200 lb. butter fat, milking twice a day; won the grand champion female honor, and competing in the two-days dairy contest, with fresh Jersey and Guernsey cows, won third place.

Another development of the present day Red Polled is seen in its betterment in an environment much superior to that which in East Anglia affects the produce of the soil no less than the live stock thereon. Many a detail is to be found in the transcript of "Progressive Milk Inheritance," where full particulars are given of Red Polled cows bred in East Anglia and sent thence to Lord Rothschild's

estate in Hertfordshire. 13315 Clarissa—W3 was noteworthy and of general repute as a competitor. Her dam, 6246 Chrissy, as the records show, was "a good milker." Clarissa began her career at Whitlingham with a high promise. This was more than fulfilled under the new conditions, which brought a milk yield of from 11,118 lb. in 332 days to 13,577 lb. in 328 days. She was then sold, and it is not unlikely that she had to pay the all too common dairyman's penalty—the being sold to kill when she had given a year or two's handsome profit. One looks in vain for any other result, by registration of Clarissa's births.

Both 18179 Mona—W3, of the same family as Clarissa, but of another line of breeding, and her dam, 17171 Minnie, made their records in a more favorable environment than that in which their predecessors lived. Minnie's record, it will be seen from the transcript was very good. Mona's began in 1905, under yet more favorable conditions, in Longford Castle herd, a few miles northwest of Salisbury, and near to a small river. Mona's milk yields are set out in detail in the transcript of the W Group. In the same herd there are many Red Polled, representing all that are now known of an old-time good High Suffolk family, V17. Their many records demonstrate the great progress attendant on careful breeding, with the equally desirable care in the matter of feeding. A few miles further up the river the Heytesbury herd, as the transcript of milk records evidence, also well demonstrates the outcome of a Western land environment.

An equally well known excellent result followed the transference of 13767 Linda 3d—P4 from Whitlingham to Acton Reynold some seven miles north of Shrewsbury, and of 16483 Desiree of Johnstown—P4 from southern Ireland to the same herd. And just as marked is the effect of the South Coast lands environment demonstrated by the Cheriton herd milk records.

"A TYPE OF FARMER'S COW."

The question of feeding the Red Polled cow, so as to give its due place to the milk-yielding inheritance, demands a few words. A good many years ago, Red Polled taken to Cheshire and to Yorkshire East Riding, did not give satisfaction. Enquiry brought out the fact that they had been so fed as to develop the beef-making inheritance, the owners not knowing, what more than one East Anglian herd owner had proved, that two Shorthorn cows in their Norfolk and Suffolk climature—to use Wm. Marshall's quaint term—required as much food as did three Red Polled. This assertion is corroborated by a communication addressed to the "Live Stock Journal" in the autumn of 1915 by the owner of some Mayo farm land, who signed himself "B." In it he said:—

"In my own scheme a native cow, but a particularly good one, was put to a pure Red Poll. The calf came a heifer, and I made this the foundation for further improvement by the Shorthorn generation after generation. The result is a plump type of Shorthorn, but enormously more productive in proportion to cost, stronger in constitution, easier to feed, easier to sell, earlier to mature, quite as high in quantity of milk, and much higher in butter. The yearling bulls are sold at nearly twice the price of my neighbors', which have cost more to raise them, and I can sell them all without leaving home. The chief representative of this family is now in the Dairy Herd Book (Polly 2d, No. 2365). A red cow well horned, near the ground, always fat, a fine milker, and 25 per cent above the requirement in

butter. No cow can get into the Herd Book on less than 600 gallons, but mine is far above that, and she did her tests for the season mainly on pasture of which the annual valuation is under 3s. 7d. an acre. To produce my blend and raise a foundation fit to carry a Shorthorn development in a region like this I had calculated on the history of the Red Poll, an animal finely specialized for dual purposes, generally milking 1,000 gallons and feeding up to a ton weight. . . . Side by side with Polly 2d I have raised also another family, from native stock and pure Shorthorn sires alone; good cows, often making high prices, but their economic inferiority makes a lesson for a nation, though the Department sticks to the formula, plus the farther inferiority of the Aberdeen-Angus. This family is represented in the Dairy Herd Book by Betty (No. 2364) and her daughter (No. 740). A great cow Betty, about equal to Polly in productive values, but at a cost more than 25 per cent higher. She can milk over half a hundred weight in the day on the three-and-seven-penny pasture; but she appears to forget that any further calf is expected of her, unless hand-fed at a rate which makes her so much less profitable than Polly."

This bit of evidence as to the two varieties of dual-purpose cow being altogether an independent testimony, and from the practical money point of view, needs must be accepted. The "Encyclopedia of Agriculture" (Edinburgh, 1909) may also be quoted as a summary of comparative results at Tring Park:—

Lord Rothschild has at Tring Park three herds: Shorthorned, Jersey, and Red Polled respectively, descended from cows chosen for their proved milk inheritance. The returns published each year are thus of the highest value for comparative purposes. Here are a few of the averages of milk yields of cows which were in the herd the whole year:—

1888-9 (372 days): 21 Shorthorn, 7896.95 lb.; 37 Jersey, 6480.08 lb.; 36 Red Polled, 7033.45 lb.

1889-90 (365 days): 34 Shorthorn, 6,785 lb.; 39 Jersey, 6,136 lb.; 34 Red Polled, 6,520 lb.

1900-01: 36 Shorthorn, 6559.2 lb.; 31 Jersey, 6,335.12 lb.; 43 Red Polled, 6,895.75 lb.

1905-6: 57 Shorthorn, 6,706.05 lb.; 21 Jersey, 6,919.61 lb.; 30 Red Polled, 6,743.81 lb.

1906-7: 46 Shorthorn, 6,787.5 lb.; 18 Jersey, 7,455.80 lb.; 40 Red Polled, 6,571.5 lb.

1907-8: 54 Shorthorn, 6,658 lb.; 9 Jersey, 5,944 lb.; 40 Red Polled, 6,174.45 lb.

The Shorthorns in the herd in 1906-7 included one 11,641 lb., four from 10,000 to 11,000 lb., three from 9,000 to 10,000 lb., seven from 8,000 to 9,000 lb., six from 7,000 to 8,000 lb., four from 6,000 to 7,000 lb., nine from 5,000 to 6,000 lb., ten under 5,000 lb. And in 1907-8, one 12,370 lb., one 11,656 lb., one 10,047 lb., six from 9,000 to 10,000 lb., seven from 8,000 to 9,000 lb., eight from 7,000 to 8,000 lb., nine from 5,000 to 6,000 lb., fifteen under 5,000 lb. In 1906-7 the individual returns of the Red Polled were:—12,005 lb., 9,381 lb., 8,000 to 9,000 lb., four; 7,000 to 8,000 lb., eight; 6,000 to 7,000 lb., fourteen; 5,000 to 6,000 lb., five; under 5,000 lb., seven. In 1907-8 13,577 lb., 9,803 lb., 8,000 to 9,000 lb., four; 7,000 to 8,000 lb., nine; 6,000 to 7,000 lb., seven; 5,000 to 6,000 lb., three; under 5,000 lb., thirteen.

It would be of value, as well as of interest, to know how far the improvement in milk and butter fat records in the United States has resulted from the adoption of the Hezelmund plan of milking, systematized at the Ladelund Dairy School, Denmark, and promulgated in America by the University of Wisconsin Agricultural Experiment Station, Bulletin No. 96, "Investigations of Method of Milking." In Bulletin No. 107, dated December, 1903, there was given full details of official tests of two Red Polled cows, and of the grade Red Polled "Lady," 5-yr.-old, with her photo process portrait. Her sires for two generations were Red Polled bulls from Mr. J. W. Martin's herd. Principal W. L. Carlyle's report on "Lady," printed in the "Chicago Breeders' Gazette," showed: Milk 10016.4 lb., fat 409.05 lb., in eight months. She was tested from January 9th to 15th, 1904, under the supervision of an expert from the Illinois Experiment Station. A note in Bulletin No. 107 gave the results: Milk 406.1 lb., fat 17.566 lb., average per cent 4.23. The cow had calved down December 27th, 1903. The food consumed by Lady during the Illinois expert's test was: Silage 210 lb., sugar beet 575 lb., hay 456 lb., corn meal 21 lb., oil meal 31 lb., gluten meal 11 lb., bran 42 lb., ground oats 21 lb.; market cost for the week, \$1.93. In one year she gave: Milk 12,585 lb., butter fat 471.40 lb., equal to 549.57 lb. of butter. Her products were at market value worth \$120.27; cost of food, \$43.96; profit, \$76.31. The paragraph thus sent forth by the chief of the Wisconsin Experiment Station had as its heading: "A Type of Farmer's Cow. In November, 1902, a communication from the Station to Mr. Martin, who had been one of the two Wisconsin men that had presented the cow for full knowledge of the type, contained this paragraph: "You will be very glad to know that the Red Polled cow Lady has just finished a week's record, in which she has given us 17 lb. of butter. She has given as high as 60 lbs. of milk in a single day. Wish that I might have a pure bred or two like her."

Lady's record continued from the year 1901-2 to the year 1905-6. At the beginning of the record she had been in milk 81 days. Her live weight was 1,158 lb. The several years' record was: Milk 9534.4 lb., fat 4.03, per cent 384.27, net profit 51.04 dol.; 11025.1 lb., fat 449.36 lb. (324), profit 62.36 dol.; 11632.6 lb., fat 492.97 lb. (322), profit 77.68 dol.; 10516.0 lb., fat 415.79 lb. (321), profit 58.30 dol.; 11287.5 lb., fat 449.73 (315), profit 69.81 dol. Total value of five years' products 576.22 dol., cost of feed 257.03 dol., net profit 319.19 dol.

A Farmer's Cow class was provided at the Chicago International Show, December, 1902. In the "Breeders' Gazette" of February 11th, 1902, Mr. McLain Smith remarked on the non-issue of the official report. The matter had, in fact, been well-nigh forgotten, though the contest was one of the richest in the show in money prizes. A representative of the "Breeders' Gazette" thereupon, after search, found in the general manager's office the papers containing the markings of the judges, which were in some way, misplaced. These showed that there were five competitors, of which four were Red Polls. Each of the cows had been tested three times during the year. 13154 Beatrice—A3 (5-yr.-old), which won first place, had milked 330 days: butter fat (estimate) 337.8 lb., 35 points. Her calf, hand-fed, weighed 710 lb. at ten months old, and, judged by form and handling, was credited with 40 per cent, while the cow got 19 points, so that the total score was 94 points. 13518 Waxy—A11

(6-yr.-old), placed third, totalled 91 points, the cow 24 points; milked 270 days, fat 287.6 lb., 31 points, the calf 36 points. 12715 Nellie's Lady—V13 (5-yr.-old), placed fourth, scored 23 points, milked 280 days, fat 276 lb., 30 points; the calf 36 points; total score 89 points. 9701 Princess 2d—H1, placed fifth, also scored 23 points, milked 360 days, fat 307.8 lb., 35 points; her calf 30 points; total score, 88 points.

Second place went to the Iowa Agricultural College for College Moore, a Shorthorn. She had milked 333 days, butter fat estimate 315.1 lb., 35 points. Her calf, 10 months, 19 days old, weighed 670 lb., and was credited with 32 points, this last being adjudged on its worth as a beef animal. This, the only Shorthorn exhibit, was awarded a total of 92 points, the cow winning 25 points, as compared with 24 points by Waxy, 23 by those which were placed fourth and fifth, and 19 by the first prize winner, whose calf was 8 points ahead of the Shorthorn's at the same age. The Shorthorn calf, when 355 days old, had increased its weight to 730 lb. But one of the Red Polled calves, which had been hand-fed, and was 380 days old when competing, had weighed 860 lb. The judges were Professor W. L. Carlyle, of the Wisconsin Experimental Station, and Professor G. E. Day, of Ontario Agricultural College.

A goodly sum was announced as subscribed for a similar open Farmers' Cow class at the Chicago International Exposition in 1903. There were, however, only two competitors. Mr. J. W. Martin's Red Polled 8487 Duchess of Wisconsin 5th—U5 was awarded first prize. Tested at the Wisconsin Experimental Station, she was credited with 9,940.1 lb. milk in 10 m., 20d., 440 lb. of butter fat, average 4.43 per cent. Her yield for 365 days was 11,015 lb. milk, 487.97 lb. fat. The official report not being published, and Mr. J. McLain Smith, the exhibitor of the other Red Polled cow, which was awarded second prize, having died, further statistics are not available. The noteworthy fact arising out of Chicago business men's endeavors to establish a Farmers' Cow competition was that it had failed through the refusal of breeders other than those of the Red Polled to meet any competitors, and to be content with the boast that the Shorthorn was par excellence the dual purpose breed.

As evidence of the cross Red Polled sire Shorthorn dam, Dr. J. R. Shingerland, of Union Village, Ohio, reported a year's feeding results (1895-6), 18 two-yr.-old steers, average 790 lb., gained 702 lb. on the average. They had no hay, as the season was one of drought, but corn (maize) fodder after the corn was husked, and each steer 50 bushels of corn. 35 Shorthorn steers "of the very best," average weight 940 lb., gained 600 lb. as the average, fed on "reasonably good pasture," corn fodder and hay, with 85 bushels of corn for each steer. All sold on the same day to the same person at 4 cents per pound.

THE BUTTER INHERITANCE

Quotations have already been given as to the butter production of the Suffolk Polled in the olden time. Arthur Young, in 1786, reported that "the butter and cheese only of a farm of 90 pounds a year let nearly at its value, sold for 140 pounds." . . . "A farm of 185 pounds a year: 121 firkins of butter, and 65 weys of cheese, these at 33s., the price sold at 306 pounds, 8 s." "Another instance, in which 20 cows made 80 firkins of butter, besides cheese; and another, in which the cows made 4 firkins of butter each, but no cheese." "Mr. Chevallier's cows have paid more than once above 8 pounds

per cow." I am well convinced, from all I heard and saw, that no other application of this wet soil, which though good, is not rich enough to fatten bullocks in a high stile, would be so advantageous as the dairy." We have it also on record that the Mrs. Chevallier who entertained Arthur Young at Aspall Hall, put the Suffolk Polled's milk to the test, and at the same time that of the Bakewell Longhorns, which were then growing into favor, and were deemed good milkers. She found that three quarts of milk from the Suffolk cow gave two and a third ounce of cream more than that from the Longhorned after standing 36 hours, and churned one-fourth more butter. An equal quantity of hot water being then added to the milk, after 12 hours the milk from the horned cow gave four ounces more cream than that from the polled.

There are no continuous records of the percentage of butter fat in the present day Red Polled herds in High Suffolk, by which there might be a comparison with the facts and figures reported by Arthur Young. But Mr. J. B. Chevallier has had tests made by Mr. F. J. Lloyd, analytical chemist of the British Dairy Farmers' Association, and by the Eastern Counties Dairy Institute, of the cows then in his herd, and there is now in the county an East Anglian Milk Record Society, which is going to do its part towards reporting results of the business. The Red Poll Society has also moved in the right direction. From tests thus made are the following transcripts:—

Whitlingham had one official test in 1888 made by Mr. F. J. Lloyd, to form part of the story of the Association's visit in the autumn of 1887. The test was an analysis of three milk yields: (a) On May 31st, when the cows had been first turned out on a new growth of grass and clover on the Sewage farm. (b) On June 20th, when drought had greatly reduced the supply of feed. (c) On July 19th, after rain had fallen, and the grass had made fair growth. (a) 2176 Coronet—T1 (2d c. April 2d), week's milk, 280 lbs.; fat, a. m. 6:10, p. m. 4.80; total solids, a. m. 15.08, p. m. 14.08. (b) Week's milk, 273 lb.; fat, a. m. 3.73, p. m. 3.93; total solids, a. m. 13.02, p. m. 13.14. (c) Week's milk, 246 $\frac{3}{4}$ lb.; fat, a. m. 3.27, p. m. 4.02; total solids, a. m. 12.43, p. m. 13.16. 2753 Di—S3 (4 $\frac{1}{2}$ yr., c. March 15th), Week's milk, 258 $\frac{3}{4}$ lb.; fat a. m. 5.86, p. m. 5.83; total solids; a. m. 15.30, p. m. 15.01 (b) Week's milk, 237 $\frac{1}{4}$ lb.; fat, a. m. 2.90, p. m. 3.68; total solids, a. m. 12.14, p. m. 13.08. (c) Week's milk, 190 $\frac{1}{2}$ lb.; fat, a. m. 4.55, p. m. 5.08; total solids, a. m. 14.00, p. m. 14.06. 1536 Silent Beauty—O9 (6 $\frac{1}{2}$ yr., c. January 12th). Week's milk, 201 $\frac{1}{4}$ lb.; fat, a. m. 5.40, p. m. 5.87; total solids, a. m. 14.50 p. m. 14.94. (b) Week's milk, 179 $\frac{1}{2}$ lbs.; fat a. m. 3.67, p. m. 4.55; total solids, a. m. 12.82, p. m. 13.63. (c) Week's milk, 154 $\frac{1}{2}$ lb.; fat a. m. 3.82, p. m. 4.59; total solids, a. m. 12.80, p. m. 13.48. On April 20th, 1889, samples taken when cows on grass feed, sent to Mr. Francis Sutton, public analyst for Norfolk: 1513 Fillpail—R11 (9 yr., 7th c. March 11th), milk 57 $\frac{1}{4}$ lb.; fat, p. m. 2.50, a. m. 3.85; non-fatty solids, p. m. 9.46, a. m. 9.30. 2875 Heedless—O2 (4 $\frac{1}{2}$ yr., 3d c. March 27th), milk 48 $\frac{3}{4}$ lb.; fat, p. m. 3.47, a. m. 4.20; non-fatty solids, p. m. 9.41 a. m. 9.10. 2457 Poppy—1 Norf. (9 yr., 8th c. April 11th), milk 46 $\frac{1}{2}$ lb.; fat p. m. 3.67, a. m. 4.45; non-fatty solids, p. m. 9.04, a. m. 9.22. The Babcock tests, taken in 1892, 1894, and 1895, mentioned in milk records of Whitlingham, when cows were on grass feed only.

When the Babcock tester was available Mr. R. Harvey Mason began its regular use in the Necton Herd. In 1892-3 he added to his published list the highest percentage of butter fat. From April

1st, 1893, he recorded the average percentage of each of the cows. The percentage of butter fat has been given with the transcripts of milk records in previous pages. A few more recent totals are appended: 9562 Mempris—N4, 291.10 lb., 238.97; 10207 Effigy—N4, 346.28 lb.; 17918 Berry—N4, 534.1 lb., 587.8, 590.52; 19220 Gemma N4, 34437 lb., 389.7, 365.385; 19753 Edna—N4, 27871 lb., 271.31; 20729 Gipsy—N4, 327.253, 271.321; 21162 Evangeline—N4, 300.3; 20316 Duchess of Necton—N6, 212.28 lb., 280.44, 301.13; 21145 Dormouse—N6, 305.84 lb.; 22093 Donna—N6, 270.11 lb., 225.68.

6835 Twin Rosebud—P3, 309.50 lb., 315.83; 18309 Sporle Eugenie—P3, 345.34 lb., 271, 399.32, 366.63, 272.74, 232.73, 236.36; 18594 Emerald—P3, 319.55 lb., 253.31, 364.43; 20722 Eve—P3, 315.51 lb., 288.79, 277.23, 335.03; 19290 Lark—L9, 335 lb., 379.4, 392.6; 18754 Moth—L9, 282.19, 246.8, 253, 270.6.

12619 Meadow Blush 2d—A1 (13½ yrs., on September 21st, 1910), milk, 22 lb.; fat, p. m. 3.8 a. m. 3.8; weight, .89 lb. 17126 Meadow Blush 3d—A1, in 1903, fat 4.4; 1904, fat 5.1; September 21st, 1910 (c. 18th January), milk, 23½ lb., fat, p. m. 5.1, a. m. 4.9; weight, 1.10 lb.; February 22d, 1911 (c. 6th February), milk, 41 lb.; fat, p. m. 3.9, a. m. 3.8; weight, 1.58 lb. 21729 Meadow Blush 5th—A1 (1st c. November 20th, 1910). February 22d, 1911, milk, 32½ lb.; fat, p. m. 4.1, a. m. 3.2 weight, 1.17 lb. In 1898 Mr. Newton reported in the Herd Book that the butter yield per 1,000 lb. milk was over 43 lb. in summer, over 44 lb. in winter.

Mr. Chevallier had a full analysis of the milk of cows in the Aspall Herd, made on February 20th, 1907, by Mr. F. J. Lloyd, in November, 1910; and three tests in 1911 by the Eastern Counties Dairy Institute. 12952 Sapphire—U3, fat 4.03 per cent, other solids 9.55; on November 23-24, 1910, milk, 21 lb.; fat, p. m. 4.3, a. m. 4.25. Calved down March 12th, 1911; May 11-12th, milk 40 lb., fat p. m. 4.2, a. m. 3.4. Her 21535 Aspall Pomona-1st c. September 2d; November 23-24; milk 28 lb., fat, p. m. 3.8, a. m. 3.8; February 20-21, 2d c.; August 4th, milk 23½ lb., fat p. m. 4.5, a. m. 3.5; May 11-12, milk 23 lb., fat, p. m. 4.6, a. m. 3.5; September 3-4, milk 32 lb., fat, p. m. 3.7, a. m. 3.5; 5th c. October 20th, 1914, fat, p. m. 4.9, a. m. 4.0. 12986 Snowball—A3, fat 3.30, other solids 9.74. 9127 Beehive—2 Suff., fat 3.68, other solids 9.18. 17291 Noisette 2d, fat 3.30, other solids 9.29; in 1910-11, milk 39½ lb., fat, p. m. 4.0, a. m. 3.0. 18522 Cineraria, fat 5.38, other solids 9.94. 19650 Cineraria 3d, fat 4.00, other solids 9.44. 19072 Cassia 2d, fat 5.18, other solids 10.90; May, 1911 (in milk 25 days), milk 56 lb., fat, p. m. 4.1, a. m. 3.2; September, milk 37 lb., fat, p. m. 4.5, a. m. 3.5. 21533 Aspall Pearmain 1st (September, 1911, 45 days in milk), milk 39 lb., fat, p. m. 3.5, a. m. 3.2. 21538 Aspall Prunella (in milk 40 days), milk 25½ lb., fat, p. m. 4.5, a. m. 3.0. 31071 Brookshill Bud 2d—A1 (in milk 88 days), milk 26 lb., fat, p. m. 4.2, a. m. 3.8; February, 1912 (in milk 38 days), milk 42½ lb., fat, p. m. 4.0, a. m. 3.6. 21589 Brookshill Bud 3d (in milk 15 days), milk 29½ lb., fat, p. m. 4.9, a. m. 4.3. 21589 Brookshill Violet (in milk 143 days), milk 25½ lb., fat, p. m. 4.6, a. m. 4.5.

The butter fat proportion of the milk yields in the several American tested Red Polled cows since January, 1908, has been set out in previous pages as part of milk record transcript. A few other facts and details may find place in this section of the essay.

Mr. P. G. Henderson, of Central City, Iowa, as proprietor of the Valley Farm Creameries, kindly furnished me with his milk deliv-

eries from his Red Polled herd in the years 1899 and 1900. These, with his remarks, were given by me in the Live Stock Journal, and are now quoted:—

Milk Delivered at Creamery in 1899						Milk Delivered at Creamery in 1900					
	Lb.	Per Cent	Amt.		Lb.	Per Cent	Amt.				
	of Butter	Butter			of Butter	Butter					
	Milk	Fat	Fat		Milk	Fat	Fat				
January	7,489	4.2	314.5		8,249	3.7	305.2				
February	8,650	4.1	354.6		10,000	3.8	380.0				
March	8,711	4.0	348.4		10,286	4.0	411.4				
April	9,758	4.0	390.3		8,877	4.0	355.1				
May	11,063	3.8	420.4		11,145	3.9	434.6				
June	12,000	4.0	480.0		12,100	3.8	459.8				
July	12,317	3.8	468.0		13,118	4.1	537.8				
August	10,390	4.0	415.6		11,050	4.0	442.0				
September	8,700	4.1	356.7		11,511	4.2	483.4				
October	6,741	4.0	269.6		11,666	4.4	513.3				
November	6,049	4.2	254.0		8,840	4.2	371.3				
December	6,760	4.0	270.0		7,411	4.0	290.7				
	108,628		4,342.3		124,253		4,991.3				
	Add		868.5		Add		998.2				

Total lbs of Butter.....5,211 Total lbs. of butter..5,989.5
Average of milk.....4,937.63 lb. Average of milk.....5,647.86 lb.
Average of butter.....236.86 lb. Average of butter.....271.89 lb.

Mr. Henderson sends me the following memoranda:—"The average of cows in each of these years supplying milk to the creamery was twenty-two. Calves are hand raised, and are fed on new fresh-drawn milk until six weeks to two months old, then they are turned on to skim milk. The calves are liberally fed. New whole milk was in 1899 the most economical feed they could have to push them along during the first weeks of their lives, for milk during the year was low in price at the creameries, averaging not more than $\frac{3}{4}$ per cent. per lb. The milk sent to the creamery from my herd is the surplus after calf feeding after each month of the year, regardless of how many calves were dry at the time. The cows, however, drop their calves through the whole year, the practice having been for years to breed the cows at first heat, so there is considerable uniformity in number in milk each month." . . . "The year 1900 was an excellent season; the year previous was rather droughty. The grass in 1900 was excellent up to November. As a few of the cows lost calves prematurely, we fed less new milk; we raised seventeen during the year. About the same number in milk as in 1899. The months of May to end of October were the months when the cows run on blue grass pasture."

Subsequent to the report in the "Live Stock Journal" of the wonderful year's record, which ended on January 11th, 1916, of [31725] Jean Du Luth Beauty—W2, at the Jean Du Luth Farm, Duluth, Minnesota, I was furnished with various details by Mr. G. P. Grout, the managing owner, and Mr. Harley A. Martin, of Gotham, Wisconsin, who as secretary of the Red Polled Cattle Club of America, received from the farm the returns month by month. The transcript of milk records shows in a previous page in the W Group that [17976] Bessie—W2, as tested in the year 1909-10, milked 303 days. She then had live weight 1,500 lb. Her [31725] Jean Du Luth Beauty was born on July 15th, 1909, when that test began, and was put to the club test on giving birth to her 2d calf in 1912. Her milk yield during the year was 10019.8 lb., butter fat 442.95 lb., and her live weight 1,195 lb. After giving birth to 3d calf she got a restful time, and increased her live weight to 1,500 lb. On the birth of 4th calf, January 11th, 1915, the new test began. The club reg-

ulation provides that there be two milkings in the 24 hours, and that there be tests from time to time by duly appointed persons. In the case of J. D. L. Beauty, as a guard against unfair suggestions, it was provided that the test should be made by experts from the Minnesota Experimental Station, with re-tests by experts from the Wisconsin Station. As a matter of fact, there were no fewer than fourteen of these experts who took part in the duty, with a fifteenth early in January, 1916, from the North Dakota Experimental Station, and Mr. Harley Martin went on duty to the farm in October. After the test had ended the following statements were made officially respecting the year's proceedings:—

Unlike most high record cows that have one constant attendant throughout their entire test period, Beauty, unfortunately, was milked by at least eight different men during the year, and she was changed from one milker to another no less than fifteen times. Four men had her feeding in charge at different times during her year's work, and one of the men who milked and fed her for four months had had absolutely no experience before with test or record cows. The luxuries of life that most World's Record Cows enjoy, such as electric fans, etc., Beauty knew nothing about. She was handled during her year's work in no extraordinary way except that a little more care was taken in her feeding than the other cows in the herd received. She was let out to water with the rest of the herd, and drank out of the river Lester until the cold weather set in. In the summer time she went to pasture and grazed on the luxuriant clover and grasses common to northern Minnesota. Her grain ration consisted of bran, oil meal, gluten feed, corn meal, Ajax Flakes, ground oats and Schumacher Feed. The proportion of each grain in the mixture was changed a good many times during the period for variety's sake. About $\frac{1}{2}$ pint of molasses was mixed with each feed of grain. Soaked dried beet pulp was also fed for a considerable time during her test. Roots were given her also and silage during the first months of her work. Clover hay and soiling crops, when the latter were available, was the bulky roughage fed her.

The record of the year's test was 20280.6 lb. milk, 891.58 lb. butter fat, and live weight increased to 1,750 lb. Mr. Grout, who is secretary of the Minnesota Guernsey Breeders' Association says: "The remarkable part of Beauty's record lies in the fact that Beauty is not a dairy type cow. She certainly has dairy qualities, but her type is that of a beef animal with great mammary development. In other words, she has both milk and beef form. Another fact that should be mentioned in connection with Beauty's record is that she carried a calf during the last four and a half months of her year." He has kindly provided me with Beauty's ration for the year:

5 tons of grain at \$29 per ton.....	\$145.00
3,650 lbs. of hay at \$8 per ton.....	14.00
3,529 lbs. silage at \$3 per ton.....	5.00
1,166 lbs. roots at .005 per lb.....	5.50
546 lbs. beet pulp at \$20 per ton.....	5.47
91 gal. molasses at .18 per gal.....	16.42

Total cost of food.....	\$191.39
Beauty produced:—	
1,065 lbs. of butter at .40.....	\$426.00
445 gal. butter milk at .30.....	133.00

Actual returns at the pail, without counting skim milk [which may fairly set against the grass feed].....	\$559.00
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TO MAKE THE MOST OF A COW

This was the heading given to a contribution of mine which appeared in the "Live Stock Journal," when Wisconsin Bulletin No. 96, thanks to Mr. J. W. Martin, was available. The British Dairy Farmers' Association, when subsequently visiting Denmark, saw Dr. Hezelmund's system being practiced, but there has been no general knowledge of it made available. The owner of a dual-purpose cow may yet find his advantage in a knowledge of the method as set forth by Mr. F. W. Woll. As chemist at the Experimental Station, he visited Denmark in 1901 to glean all that was to be known, and on his return aided in giving it a full trial. Here is what he says of it:—

THE METHOD

The new method of milking consists in following up ordinary rapid and thorough milking by a set of manipulations of the udder which bring down the last traces of milk contained therein. By a few manipulations of the udder this residual milk may readily be brought down in a couple of minutes' times, and more milk will, as a rule, be obtained in this way than is possible by the ordinary stripping method. Since the milk thus secured is very rich, being of the same character and composition as "strippings," the amount of additional butter fat obtained is considerably greater than might be supposed from the quantity of milk brought down. So much for the result. How is it obtained, and what are the "manipulations?"

THE THREE MANIPULATIONS

First Manipulation—The right quarters of the udder are pressed against each other with the left hand on the hind quarter, and the right hand in front on the forequarter, the thumbs being placed on the outside of the udder, and the four fingers in the division between the two halves of the udder. The hands are now pressed toward each other, and at the same time lifted toward the body of the cow. This pressing and lifting is repeated three times, the milk collected in the milk cistern is then milked out, and the manipulation repeated until no more milk is obtained in this way, when the left quarters are treated in the same manner. If the udder is very large only one quarter at a time is taken.

Second Manipulation—The glands are pressed together from the side. The forequarters are milked each by itself by placing one hand, with fingers spread, on the outside of the quarter and the other hand in the division between the right and left forequarters. The hands are pressed against each other, and the teat then milked. When no more milk is obtained by this one manipulation, the hind-quarters are milked by placing a hand on the outside of each quarter, with fingers spread and turned upward, but with the thumb just in front of the hindquarters. The hands are lifted and grasp into the gland from behind and from the side, after which they are lowered to draw the milk. The manipulation is repeated until no more milk is obtained.

Third Manipulation—The fore teats are grasped with partly closed hands and lifted with a push towards the body of the cow, both at the same time, by which method the glands are pressed between the hands and the body. The milk is drawn after each of the three pushes. When the fore teats are emptied, the hind teats are milked in the same manner.

In the University herd 24 cows being tested the average daily milk yield was thus increased by 4.5 per cent, and the butter fat by 9.2 per cent, the trial time being five weeks. The average daily gain in milk was 1 lb., and of butter fat .09 lb. per head. In the 12 Wisconsin farm and dairy herds the daily average increase of milk yield was 1.08 lbs. and .1 lb. of butter fat.

BEEF-MAKING INHERITANCE

The development of the beef-making inheritance of Red Polled cattle since its first demonstration at Holkham, in 1812, is made plain by the live weights of steers and heifers competing at the annual November and December competitions; by the percentages of gain in live weight of steers from the "under 2-yr.-old" to the "under 3-yr.-old" competing stage; and by the many published statements of carcass weight of animals when sold by public auction.

A photograph of the cow 310 Lily—N2, taken at Elmham in 1875, when she was 20 years' old, was given me by Mr. Fulcher just before she was sold to Mr. Loft and taken to Troston. It is now among the Norwich Public Library Photographic Survey Records of Norfolk and Norwich. Her last calf was born at Troston in April, 1876. She was a daughter of 342 Minnie—N2, which cow was sired by Necton Prize Bull 120 (winner at the Norwich R. A. S. E. Show). She was born in 1854, and gave birth to her last calf in March, 1873. The daughter Lily had through her sire a mixture of Suffolk and the Reeve Red Polled blood, but the old-time Necton blood was so strong in her that it was "like mother, like daughter," and that gives to this photograph a unique value. At the opening display of Local Record Photographs, on December 1st, 1913, was also shown a photograph, taken in August, 1882, of the third in descent from Lily, 1463 Dolly—N2, born 3d of November, 1879, and a frequent Royal and County winner from 1881, closing her honors list by first place in a class of 30 cows and the championship, every one of which was honored, at the Norwich R. A. S. E. in July, 1886. The portrait was reproduced in the "Live Stock Journal Almanac" of 1883. Also in the 1883 issue of the Herd Book, and in 1885, in the "United States Consular Reports on Cattle." The contrast in form and development of flesh as seen in the two photographs is very great, the outline of Dolly being that of a fully developed heifer of the ideal that appealed to Bakewell, Charles Collins, and Thomas Booth, which became the fashion, and is yet stoutly upheld by a large proportion of Shorthorn breeders and owners. In the group of Red Polls just mentioned there are yet two other portraits showing similar development—the bull Davyson 3d, 48 (of the H1 Family the original photograph, taken on March 19th, 1881, when the bull was 7 yr., 7 m. old, was the frontispiece of the 1883 issue of the Herd Book), and 1855 Silent Lady—O9, photographed when she was 1 yr., 8 m. old. As further testimony of the progress made in the details so precisely specified as the evidence of merit, we quote the Official Reporter of the 1886 R. A. S. E. Show at Norwich:—

The most sanguine of East Anglians could not for a moment have imagined that so grand a collection of Red Polls could have been possible. The improvement made during the past few years in the style, substance and quality of the animals, as well as the advance towards uniformity of type, is within measurable of the marvelous. No stronger proof of this can be desired or given than is to be found in the fact that the Judges (all three of whom are keen men of business and thoroughly practical) commended in its entirety the Class of Cows with its thirty entries. Such an event as this is almost unknown, and but very seldom deserved.

The sire of 1463 Dolly—N2 (above named) was Rufus 188. He was also sire of Dolly's dam, 1084 Polly—N2, gr.-sire of 1855 Silent Lass—O5, of 2495 Rosalie—K17, of 2773 Easton Rose—P3, and of 2976 Midsummer Rose—K17, all of which were in the honors list above mentioned. Rufus' dam, 600 Thursford Rose—P3, was sired by Norfolk Duke 127. Through the sire, The Palmer 138, which was of A3 Family named in the Milk Records, Rufus got a dash of Suffolk blood, so that his breed analysis reads: N. 512.5, S. 34.37, RP. 453. In 1883 a 33 $\frac{1}{2}$ months' steer of his get, dam 1900—T4, weighed 1,625 lb., carcase (fore and hindquarters) 1,018 lb. 1715 Olivia, 1st prize and reserve for the plate, age 34 months, 1,664 lb., carcase 1,214 lb. In 1884, 20 months' steer, d. 1343 Brown—P2, breed cup winner, 1,697 lb. In 1884, 343 Minnie 3d—N2, age 13 yr., 4 m., sired by the same bull as The Palmer 138, 2,103 lb. She had gained 3 lb. per day after being shown at Norwich. In 1885, 1674 Minnie 6th—N2, age 7 yr., 4 m. (sire of the N2 family), 1st in class, cup as best Red Polled, 2,181 lb. 1569 Hetty—P1, age 7 yr., 11 m., s. Rufus, 1,891 lb. Steers by Roundhead 564—son of Rufus' Cromwell 647, whose dam 1463 Dolly: (d. 1896 Tipple—T4), 19 $\frac{1}{2}$ m., 1,000 lb., 31 $\frac{1}{2}$ m., 1,636 lb., gain 636 lb., 63.33 per cent; 34 m. steer (d. I18), 1,686 lb., 31 m. steer (d. 3469 V9) 1,322 lb.

Norfolk Duke 127, born June 27th, 1865, was one of the Red Polled bought of N. Powell by B. Brown, and sired a goodly number of bull and cow calves until he had passed his 15th year. The Jean Du Luth Farm catalogue of its Red Polls, issued early in August, 1916, in its form the finest bit of work yet produced, with 20 page-photo portraits, besides photos of the heads of others—in its extended pedigree pages makes a note of the number of times the name Norfolk Duke 127 occurs in a complete extended pedigree. The note appended to that of [31725] Jean Du Luth Beauty—W2, the record cow of the Red Polls, reads.—

To the student in breeding it is of interest to know that this cow, with her wonderful constitution, traces 96 times to Norfolk Duke, 32 times to Tenant Farmer, 13 times to Red Jacket, and 13 times to Hero of Newcastle, all of which were great prize winners in England.

Powell 143, Royal Duke 181, Strawberry Duke 210, Young Duke 234, Duke of Norfolk 295, Norfolk 381, Sir Thomas 420, Bergamot 455, Favorite 492, Philip 538, were sires that carried on the renowned bull's merits to another generation, while Tenant Farmer 213 transmitted the combination of Powell and Pond blood in the early days of registration. Thus early was the dual purpose ideal maintained, and the early steps taken in a progressive milk and beef inheritance.

Davyson 3d 48, a bull of the H1 Family, of whom mention has been made, inherited through its dam 169 Davy 7th—H1, by Young Duke 234, the blood of both Norfolk Duke and Tenant Farmer. As Davyson 3d's sire was a combination of H1 and H2 blood, its Breed Analysis reads: N. 575, RP. 425. He was bought at public auction when 7-yr.-old for 205 guineas for the founding of the Didlington Hall Herd, and two years later his live weight was returned to me at 2,093 lb. A 29 months steer of his get weighed 1,676 lb. Another, put up to fatten, at 18 $\frac{3}{4}$ m. weighed 1,388 lb., at 28 $\frac{1}{4}$ m. 1,750 lb.

Iago 1025, dam 1855 Silent Lady—O9, daughter of Rufus, and gr.-son of Rufus through Othello 713, whose dam was of K17 family, was much used in Mr. Colman's herd, and fully maintained the reputation of Rufus. He was the sire of 5367 Coronet 2d. One of his sons, out of an E2 cow, weighed, at 21 $\frac{1}{4}$ m., 990 lb., at 33 $\frac{1}{4}$ m. 1,471 lb., gain 48.48 per cent. Another, out of an R2 cow, weighed 1,368

lb. at 26 $\frac{3}{4}$ m. A 40 $\frac{1}{4}$ m. heifer, out of an E13 cow, 1,288 lb. Iago's Breed Analysis: N. 368.75, S. 117.17, RP. 514.08.

Falstaff 303, dam 891 Fanny Bradfield—A11, was a son of Rufus. His influence was most widespread. A steer got by him weighed 1,952 lb. at 41 $\frac{1}{2}$ m. His son, Lancer 689, dam a Pond cow, sired a steer at 34 m., weighed 1,842 lb., the produce of a Davy cow. A 7 yr., 5 m. 1 Norf cow of his weighed 1,903 lb. One of Falstaff's sons, Laureate 1563, did good service in Australia. Others of his sons won a good reputation both for the milk and beef inheritance in England and in the United States. Falstaff's Breed Analysis: N. 731.25, S. 42.18, RP. 226.56.

A grandson of Falstaff, through Bardolph 977, which had O9 blood through his dam, was Starlight 2531. His dam, 1355 Buxom—K19, was got by Davyson 3d 48. Starlight was put to 2213 Gleaner—V9, which, in 1894, gave 14,184 lb. milk in 365 days, giving birth to her 11th and last calf on November 14th, 1893, so that her total yield after that birth greatly exceeded the record just named. On January 3d, 1892, she gave birth to twins—a bull and a heifer—Harvester 3131 and 7896 Golden Grain. In November, 1892, being then 21 $\frac{1}{2}$ m. old Harvester competed at the Norwich Fat Cattle Show; his live weight was 1,238 lb. In 1894 both competed. Harvester then weighed 1,735 lb., gain 476 lb., being 40.14 per cent for the year. He won first prize and the cup, and was also first at the Smithfield Club Show. A year later his live weight was 2,153 lb., gain 421 lb.; 2 years' total gain 918 lb., 74.14 per cent on his first competition. Golden Grain had also been fatted, and at 33 $\frac{1}{2}$ months weighed 1,452 lb. She was first and the reserve for the cup both at Norwich and London. Gleaner's sire was Lord George 520, a son of Norfolk Duke 127, with E2 blood through his dam and her dam, the get of a bull which combined both Eaton and [Necton] Minnie—N2 blood. Another heifer of Starlight's get, 6215 Bride Elect, which combined A1, I9, and W3 blood, when 34 months old weighed 1,508 lb.

The Milk Records of W14 Family credited 2037 Bracelet, with 3d c.-9,283 lb (323). Her 4475 Brace, by Falstaff, gave 1st c.-4,529 $\frac{3}{4}$ lb. (282), and 2d c. 4,199 lb. for the latter half of the year, when she was transferred to Mr. Colman's herd, where to a gr.-son of Iago she bred 9169 Buckle. This heifer was shown at Norwich when 30 m., 20 d. She won 1st; at the Smithfield Club Show 2d and the reserve for the breed cup; her weight 1,629 lb., and the firm which slaughtered her reported as being "without exception the very best heifer we have seen or killed." Two years after, Brace's 10946 Armlet, which was sired by Red Prince 2902, when 30 m. old won 2d honors, live weight 1,672 lb.

18762 Linda 3d—P4 affords a most complete illustration of the dual-purpose in Red Polled cattle. Her milk record has been set out in a previous page. Her dam, 5650 Linda—P4, was sired by Iago 1025. She, like her dam, 4187 Lydia—P4, was a steady milker, with results ranging from 4,600 lb. to 7,297 lb. during a long course of years at Whitlingham. Lydia's sire was Lord George 520, son of Norfolk Duke, so there was a good inheritance of the beef-making quality. Linda 3d's sire, Planet 4579, was a son of Erebus 841, which was sired by Falstaff 303 out of a choice L3 cow, and did good service in the Necton herd. Planet's dam, 5052 Peach—P1, was sired by Ferdinand, of the P3 line, at Marham, and her gr.-sire was Norfolk Duke. Both P1 and P3 stock were so bred as to win high renown for the Marham herd as the home of grand dual-purpose cattle.

Linda 3d's 17879 Acton Dairymaid, County and Royal prize winner, 1st and cup winner at Norwich, Smithfield and Ipswich Fat Stock Shows, weighed 1,842 lb., and was sold for 34 pounds. A steer of Linda's, at 19 $\frac{1}{4}$ m. weighed 1,263 lb., at 31 $\frac{1}{2}$ m. weighed 1,786 lb., gain 523 lb., 41.409 per cent. In carcass competition in 1905, a 18 m. steer, live weight 1,009 lb., carcass 640 lb.; a 25 m., reserve honors, 1,153 lb., carcass 743 lb.

The Palmer 138's Brundish Prince 462 has a record of a steer (d. 5296—R9), at 23 m. 1,320 lb.; 35 m. 1,820 lb.; gain 500 lb., 37.38 per cent. Davyson 3d 48's 28 m. steer (d. K19), 1,676 lb. Through King Charles 329 the sire of 2536 Silent Beauty—O9, and himself from K19 dam, Davyson 3d's gr.-son, Don Carlos 659 (d. 1023 Miss Atkins—K17), was also represented at Fat Stock Shows, 20 $\frac{1}{2}$ m. steer, 1,158 lb., 32 $\frac{1}{2}$ m. 1,648 lb., 44 $\frac{1}{2}$ m. 1,964 lb., gain 806 lb., 69.6 per cent; 44 m. steer (d. I19), 1,944 lb.; 22 $\frac{1}{2}$ m. steer (4764 Annie—E11), 1,203 lb.; 30 m. heifer (d. I18), 1,384 lb.; steer (d. 4764 E11) 22 $\frac{1}{2}$ m., 1,208 lb., 34 $\frac{1}{2}$ m., 1,655 lb.; gain 447 lb., 37 per cent. (Smithfield Club Cup winner).

Red Prince 2902—son of Laureate 1563 above noted, dam 5077 Prize—T1—for the most part passed on his inheritance through sons and gr.-sons which were in high repute as sires for both milk and beef. Among these were a gr.-son, Ruby Prince 4131 (d. 6759 O9). Sons: Crown Prince 4319 (d. 9448 I21), Corporal 4313—exported to America, as already noted—(d. 5367 Coronet 2d), The Prince 4587 (d. 7553 R11), Red Prince 2d 4607 (d. 997 V2), Redmond 5147 (d. 8377 Brunhilda—P3, exported to America), Champion 5370 (full brother of Corporal 4313), Crown Diamond 6104 (another full brother of Corporal), Red Lord 5820 (d. 6585 P3). After Mr. J. J. Colman's death the Easton Lodge Farm herd of Red Polled cattle was sold in March, 1899. Nineteen of the twenty-five animals bred there were sired by Red Prince—which renowned bull died at Whitlingham a fortnight before the day of the sale. Their average was close on 80 pounds. 6308 Dorena—N2, which, with four of her descendants realized at the sale 1,285 guineas, gave birth to a calf sired by Red Prince; Steered at 18 m., it weighed 1,398 lb.; at the next year's Smithfield Club Show, when he won the breed cup, his live weight was 1,880 lb.; gain 582 lb., 44.83 per cent. At the same time a 30 $\frac{1}{2}$ m. heifer, also from the Easton herd, and a Royal winner, weighed 1,660 lb.

Breed Analyses: Red Prince, N. 583.00, S. 45.69, RP. 371.28. Redmond, N. 551.65, S. 68.35, RP. 379.97. Brunhilda, N. 520.31, S. 91.01, RP. 388.67. Corporal, N. 530.56, S. 61.12, RP. 408.29. Red Lord 5820, N. 576.26, S. 46.18, RP. 383.78. His Red Knight 7583, N. 537.12, S. 102.86, RP. 359.99:—d. 12638 N4, N. 497.99, S. 159.54, RP. 34243. Red Prince's Buffalo Bill 5349, N. 369.02, S. 394.72, RP. 235.64:—d. 2013 W3, N. 106.25, S. 743.75, RP. 100; gr.-son, Red Duke 8623, N. 531.84, S. 150.67, RP. 317.45:—d. 9491 W2, N. 452.53, S. 243.59, RP. 303.85.

The Breed Analysis of some of the several other bulls which sired cows that made a good record and steers which fed economically will be desirable for students of heredity:—

Donald 291, N. 675, S. 218.75, RP. 156.25; his dam, 177 A4, N. 525, S. 368.75, RP. 106.25; his son, Stout 581, N. 375, S. 571.87, RP. 53.12; d. 935 U3, N. 75, S. 925.

Stout's Rinaldo 556, N. 481.25, S. 465.62, RP. 53.12; d. 1336 I9, N. 587.5, S. 359.37, RP. 53.12. Rinaldo's gr.-son, Gordon 1842, N.

477.73, S. 447.16, RP. 7509; d. 3411 A1, N. 433.59, S. 536.52 RP. 29.88.

Didlington Davyson 2d 657, N. 592.96, S. 30.41, RP. 376.56; his d., 1448 H1, N. 621.87, S. 4062, RP. 337.5.

Abbot 2d 2576 (gr.-son of Cromwell), N. 461.93, S. 224.84, RP. 313.21; d. 473 W3, N. 400.39, S. 400.48, RP. 199.12.

Paribus 3625, N. 642.96, S. 100.97, RP. 256.05; d. 4340 L12, N. 635.95, S. 116.79, RP. 247.26.

Othello's gr.-son, Majoliini 3600, N. 601.94, S. 38.08, RP. 359.95; his d., 6518 L9, N. 785.93, S. 34.76, RP. 179.29. His son, Magician 5021, N. 630.14, S. 87.66, RP. 282.18; d. 9562 N4, N. 658.34, S. 137.24, RP. 204.40; and his gr.-son, Marmion 5674, N. 555.25, S. 94.70, RP. 350.01; d. 9833 P3, N. 508.57, S. 151.33, RP. 340.07.

Emperor 3483, N. 614.74, S. 124.57, RP. 260.66; his d., 3988 N6, N. 579.49, S. 164.0, RP. 256.49.

Suffolk Baronet 583, N. 193.75, S. 556.25, RP. 250; his d., 393 O5, N. 100, S. 800, RP. 100. His g.-gr.-son, Randolph 1603, N. 332.42, S. 479.78, RP. 187.79; d. 3755 U6, N. 437.5, S. 500, RP. 62.5.

Monk 1573, N. 548.14, S. 65.77, RP. 386.05; his dam, 3617 K19, N. 550.19, S. 118.47, RP. 331.28. Monk's son, Minotaur 2839, N. 645.94, S. 41.47, RP. 312.55; his dam, 3013 N5, N. 743.75, S. 17.18, RP. 239.06. Minotaur's sons, Starston Remus 4158 and Starston Romulus 4159 (twins), N. 567.30, S. 130.64, RP. 302.02; their d., 6222 K19, N. 488.67, S. 219.81, RP. 291.50.

Lord Kitchener 7316, N. 864.84, S. 5.27, RP. 129.83; d. 2381 2 Norf., N. 1,000.

Comely Roger 3856, N. 303.45, S. 553.98, RP. 142.53; d. 6258 V1, N. 355.21, S. 446.71, RP. 198.04.

Samson 4647, N. 238.67, S. 615.33, RP. 145.97; d. 8244 2 Suff., N. 208.34, S. 663.02, RP. 128.63.

Proctor Knott [12092], N. 490.27, S. 95.10, RP. 414.59; d. 8858 E11, N. 449.99, S. 129.09, RP. 420.89. 8858 E11's sire, Hesperus 1394, N. 460.93, S. 59.76, RP. 479.29; d. 2342 P1, N. 446.87, S. 2577, RP. 527.34.

Select Man 2049, N. 536.50, S. 142.91, RP. 320.55; his d., 4826 1 Norf., N. 621.87, S. 279.29, RP. 98.82; his son, Morgan 5724, N. 592.56, S. 170.64, RP. 236.76; d. 8063 K23, N. 563.27, S. 214.74, RP. 221.96; Rufus' gr.-son, Francillo 669, gr.-sire of 8063—K23, N. 590.62, S. 44.52, RP. 364.84; d. 1506 A9, N. 750, S. 71.87, RP. 178.12. Francillo's gr.-son, Minnesota Chief 2430, N. 326.55, S. 416.59, RP. 256.83; d. 3008 V2, N. 231.24, S. 503.12, RP. 265.62.

Cresco David [13445], N. 501.29, S. 177.63, RP. 321.03. His d. [18104] T4, N. 449.88, S. 211.35, RP. 338.74.

Nailer 7396, N. 564.69, S. 156.30, RP. 278.96; d. 11904 1 Norf., N. 627.63, S. 194.11, RP. 178.19. His Dafter [15871] N. 486.79, S. 284.81, RP. 228.34; d. [23509] B7, N. 408.90, S. 413.33, RP. 177.72.

The following are later records of gain in weight by a second year of feeding: Steer 2,180 lb., gain 536 lb., 32.59 per cent; 31 m. steer, 2,251 lb., gain 489 lb., 45.70 per cent; 33 m. steer, 1,536 lb., gain 480 lb., 43.01 per cent; 31 1/4 m. steer, 1,694 lb., gain 601 lb., 53.78 per cent; 35 m., 9 d. steer, 2,484 lb.; 30 m. steer, 1,632 lb., gain 434 lb., 36.22 per cent; steer 1,824 lb., gain 388 lb., 27 per cent; steer 1,662 lb., gain 458 lb., 38.36 per cent; 35 m. steer, 1,683 lb., gain 340 lb., 26.2 per cent; 21 1/4 m. steer, 1,344 lb.; 35 m. 4 d. steer, 1,732 lb., gain 390 lb.,

28.31 per cent; 35 m. 2d., 1,807 lb., gain 492 lb., 37.41 per cent; 33 $\frac{3}{4}$ m. steer (d. 19438 7 Suff. by Red Lord 5820), 1,791 lb., gain 464 lb., 34.95 per cent; 34 m. 2 d. steer (cup winner London Show, d. 19669 H1), 1,842 lb., gain 499 lb., 37 per cent; 31 $\frac{1}{2}$ m. steer (d. 21088 Charming Davy 6th—H1), 1,805 lb., 365 lb., 25.35 per cent; 31 $\frac{3}{4}$ m. steer (d. 21096 Charming Davy 8th—H1), 1,664 lb., gain 448 lb., 36.18 per cent; 31 $\frac{1}{4}$ m. steer (d. 21167 Fedora—P3), 1,492 lb., gain 362 lb., 32 per cent; 34 m. steer (d. 22219 Perfume—P1), 1,736 lb., gain 364 lb., 26.53 per cent; 34 $\frac{1}{4}$ m. steer (d. 21610 Crackle—O1) 1,620 lb., gain 366 lb., 29.18 per cent; 35 m. steer (d. 21971 Ashlyns Polly—E11), 1,736 lb., gain 504 lb., 40.9 per cent; 34 $\frac{1}{4}$ m. steer (20473 Pansy—P1), 1,856 lb., gain 432 lb., 40 per cent; 30 $\frac{1}{2}$ m. steer (winner Norwich special, d. 19975 Pretty Flower 3d—7 Suff.), 1,517 lb., gain 513 lb., 50 per cent; 34 $\frac{1}{4}$ m. steer (d. 21525 Ashmoor Belle—W3), 1,496 lb., gain 412 lb., gain 38 per cent.

A few records of weights of heifers at Christmas Shows from 1910 may also be quoted:—34 $\frac{1}{4}$ m. heifer (cup winner in 1910 d. 19976—7 Suff.), 1,752 lb.; 28 $\frac{3}{4}$ m. (d. 20130 7 Suff., both heifers by Red Lord 3820), 1,763 lb.; 32 $\frac{1}{2}$ m. (d. 19218 V9), 1,637 lb.; 34 $\frac{3}{4}$ m., 1,518 lb.; 32 m., 1,644 lb.; 22 $\frac{3}{4}$ m. (d. 20444 T18) 1,257 lb.; 33m. (d. 1928 V9), 1,574 lb.; 33m. (d. 21138 H1), 1,495 lb.; 28 $\frac{1}{2}$ m. (d. 21891 W3), 1,736 lb.; 31 m. (d. 22188 W3), 1,610 lb.; 33 $\frac{1}{2}$ m. (d. 22904 A4), 1,736 lb.; 34 $\frac{1}{4}$ m. (d. 22901 A4), 1,406 lb.; 33 $\frac{1}{2}$ m. (d. 19334 2 Norf.), 1,272 lb.

It is worth noting that since the 1909 Norwich Show, when there were 12 young steers competing averaging 1,231 lb., the entries have been much fewer. This circumstance strengthens the statement made to me before that year that purveyors in the London area and in other populous centers had intimated to breeders of the Red Polled their wish to secure the fatted young stock regularly, by letter, or, if so desired, by sending an agent to buy.

In slaughter tests at the Chicago International Exposition during seven years: Of 2-yr.-old steers, Red Polled have recorded, year by year: 1,960 lb., dressed weight 1,165 lb. percentage 59.3, fat 17 lb.; 1,660 lb., 1,148 lb., 69.2 per cent, 57 lb.; 1,632 lb., 1,087 lb., 66.6 per cent; 1,510 lb., 974 lb., 64.5 per cent; 1,550 lb., 1,065 lb., 68.71 per cent; price per lb. 10 $\frac{1}{2}$ c.; 1,545 lb., 1,002 lb., 64.85 per cent; 10 $\frac{1}{2}$ c. per lb. (Both these steers were sired by Nailer 7396. Breed Analysis: N. 564.69, S. 156.30, RP. 278.96). 1,610 lb., 1,050 lb., 65.2 per cent, 11 $\frac{3}{4}$ c. per lb.; 1,624 lb., 1,071 lb., 65.9 per cent, 11c per lb. 1,576 lb., 1,013 lb., 64.21 per cent, 11c per lb. 1,576 lb., 1,013 lb., 64.21 per cent, 9 $\frac{1}{4}$ c. per lb. 1,280 lb., 840 lb., 65.6 per cent, 12c. per lb.; 34 m. heifer, 1,370 lb., 887 lb., 64.7 per cent, 11c. per lb. 1,510 lb., 934 lb., 61.85 per cent, 14c per lb.; 1,576 lb., 958 lb., 61.41 per cent, 13c per lb. For comparative purposes the highest results of Shorthorns are noted: 1,360 lb., 796 lb., 58.5 per cent; 1,465 lb., 1,002 lb., 68.39 per cent, 9 $\frac{1}{2}$ c. per lb.; 1,404 lb., 889 lb., 63.61 per cent, 9 $\frac{1}{4}$ c. per lb.; 1,254 lb., 787 lb., 62.76 per cent, 11c. per lb. Of yearling Red Polled: 1,430 lb., 945 lb., 66.8 per cent, 48 lb. fat; 1,350 lb., 874 lb., 64.7 per cent, 34 lb. fat; 1,324 lb., 833 lb., 62.9 per cent—this and the next steer were also sired by Nailer—1,280 lb., 827 lb., 64.78 per cent.

THE PURVEYORS

From the foundation of the Suffolk Fat Cattle Club Messrs. Robert Bond and Sons—members of which firm have undertaken the

secretarial duties—have, on the second day of the December Show, offered much of the stock for sale by public auction. A condition of the sale for more than 25 years has required the purchaser to report to the secretary the weight of the dressed carcase, and with this detail available there has accumulated in the annual reports much valuable material expressive of the butchers' point of view. The following notes give the highest prices per stone of 14 lb. of dressed carcase:

1906 Sale: Red Polled 15 m. steer, live weight 1,255 lb., carcase 746 lb., 53.78 per cent, 9- per st.; 23 m., 1,430 lb., 822 lb., 56.86 per cent, 9-10½ per st. Shorthorn, 20 m., 1,164 lb., 696 lb., 59.79 per cent, 9-10½ per st.; prize pair, 1,428 lb., 878 lb., 61.48 per cent, 9-6¾ per st., and 1,357 lb., 826 lb., 60.86 per cent, 9-5¾ per st.; 33 m., 1,748 lb., 1,132 lb., 64.75 per cent 8-7½ per st. Scot, 1,434 lb., 906 lb., 62.74 per cent, 9-3¼ per st.; 22m., 1,240 lb., 806 lb., 64.36 per cent, 9-2½ per st. Cross-bred, 14½ m., 1,072 lb., 650 lb., 60.63 per cent, 10-1½ per st. 35 m. Angus-Shorthorn, 1,690 lb., 1,042 lb., 65.29 per cent, 9-3 per st.

1908 Sale: Red Polled 21 m. heifer, 1,161 lb., 906 lb., 58.82 per cent, 10-2¾ per st.; 23 m. 17 d. heifer, 1,265 lb., 738 lb., 58.33 per cent, 10-2¾ per st.; 23½ m. steer, 1,334 lb., 790 lb., 59.62 per cent, 10-1 per st.; 13 head sold—lowest price per st., 8-8. Shorthorn, 23 m. steer, 1,524 lb., 939 lb., 61.61 per cent, 9-10 per st.; 24¾ m., 1,624 lb., 981 lb., 60.40 per cent, 9-3¾ per st.; 31 m., 1,629 lb., 57.94 per cent, 9-5¾ per st.; 14 head sold—lowest price per st., 8-1¾. Short-horn-Angus, 21 m., 4 d., heifer, 1,215 lb., 790 lb., 65.02 per cent, 9-8½ per st.; 35 m. blue grey heifer, 1,652 lb., 1,116 lb., 71.81 per cent, 7-7¼ per st.

At the 1909 sale there were 10 Red Polled, a steer and 3 heifers from registered stock. The 22m. heifer weighed 1,620 lb., carcase 572 lb., 64.33 per cent, 10-1¾ per st. The other heifers: 30¾ m., 1,342 lb., 868 lb., 64.20 per cent, 9-6¾ per st.; 38 m., 1,605 lb., 1,076 lb., 67.04 per cent, 8-7 per stone. The steer, 35 m., 1,792 lb., 1,138 lb., 64.06 per cent, 9-4½ per st. Another steer, "under 2 yrs.," 1,076 lb., 642 lb., 59.66 per cent, 10-0¼ per st. Lowest price of steers, 9-0¼. Of 10 steers and 2 heifers, Shorthorn, 22 m. steer cup winner, 1,220 lb., 786 lb., 64.42 per cent, 10-3¾ per st. Two others same age realized respectively 10-7½ and 9-11¼, while two 16 m. old made 10- and 9-5½. Of the 34 m. heifers, one had a percentage 64.15, and realized 8-6¾ per st., the other 64.70, and realized 8-4¾. Two "Black Polled Scot" steers were sold: 35½ m., 1,788 lb., 1,081 lb., 60.45 per cent, 10-8¾ per st.; the other, 39 m., 1,548 lb., 944 lb., 60.90 per cent, 10-4½ per st. Three Aberdeen-Angus, weighing from 1,549 lb. to 1,576 lb., carcase 1,032 lb. to 1,016 lb., realized from 8-11½ to 8-8 per st. A Hereford 20 m. heifer gave 65.05 per cent, and realized 9-9 per stone. From 10-2½ to 9-10¾ were the price per st. realized by young blue greys.

In 1910 Red Polled realized from 9-10¾ to 7-10¼ per st. Shorthorns from 9-8 to 7-7½ per st. Black Polled 8-9¾ and 8-4¾ per st., by 3-yr.-old steers. Angus-Shorthorn steers, 26 m., 10-0¼ and 9-8 per stone.

At the 1912 sale all the 12 Red Polled were from registered stock. 18½ m. steer, 1,034 lb., 616 lb., 59.45 per cent, 11-1½ per st.; 18¾ m., 60.43 per cent, 10-7½ per st.; 22½ m., 58.78 per cent, 10-10¼ per st.; 22½ m., 62.77 per cent, 10-2½ per st.; lowest price given, for a 30¾ m. steer, 64.62 per cent, 8-7½ per st. Three heifers' percentages, ranging from 68.15 to 58.63, realized from 9-7 by

a 19-m. old, to 8-6½ by a 32 m. old. Only 4 Shorthorn sold: highest realized 10-0¼ per st. A 23 m. Dexter, 10-4½ per st. Of 7 Scots, a 19½ m. steer realized 10-5, a 36¾ m. heifer 10- per st.; the others from 9-6¾ to 9-1½ per st. A 19¾ m. cross-bred heifer realized 10-7¾ per st., a 20¼ m. steer 10-5¼.

Prices at the 1914 sale ruled high. Of 13 Red Polled, a 21¼ m. steer, which gave percentage 63.31, the carcase realized 11-3½ per st., a steer 11-6½, the remaining 11 from 11-2¼ to 10- per st. Of 6 Shorthorn, a 21 m. steer 11-4½ per st., the others from 11-0¾ to 9-10. A 21 m. Scot, 10-8¾, and a 18 m. old, 10-3¾, and an older, 9-8¼ per st. Cross-breds—blue-grey polled and Angus-Shorthorn, from 11-2¾ to 9-2¼ per st.

The 1915 sale included 11 Red Polled: 21 m. 27 d. heifer champion, 1,136 lb., 710 lb., 60.50 per cent, 13-9½ per st. 22½ m. steer, 56.70 per cent, 13-8½ per st.; 20½ m. 57.97 per cent, 13-6½ per st.; 15½ m., 62.60 per cent, 12-9¾ per st.; 5 12-9½ to 12-1½; 34¾ m., 1,308 lb. heifer, 60.81 per cent, 11-4½. (All these from registered stock). A 21 m. 1,132 lb. cross-bred, 59.71 per cent, made the highest return, 14-0¾ per st., while the 35¾ m. 1,596 lb. champion steer, 65.87 per cent, sold at 9-8¼ per st. The highest priced Shorthorn, 20 m., 1,172 lb., 60.58 per cent, sold at 13-9½ per st. A 25 m. 19 d. Aberdeen-Angus, 62.27 per cent, 12-4¾ per st. The average of 21 beasts under 2-yr.-old was 12-8 per st.; of 11 under 3-yr., 10-11¼.

PAN-AMERICAN EXPOSITION, 1901

BUFFALO, N. Y.

MODEL DAIRY SIX MONTHS' TEST

Supplementary to the preceding essay, this and another quotation that follows from an American Experiment Station Bulletin, relate to matters of particular interest to the student of Farm Economics. Mention has been made in the essay of a Six Months' Test of five cows of each of ten breeds at a Model Dairy, which was a unique attraction of the Pan-American Exposition, held at Buffalo, N. Y., from May 1st to October 31st, 1901. At the Chicago World's Columbian Exposition, held in 1893, there was a Fifteen Days' Cheese Test, in which 25 of each of the three breeds—Jersey, Guernsey, Shorthorn—took part. The summary gives the following results:—

25 Jerseys: Live weight gained 327 pounds, value \$14.72, milk 12,296.4 pounds, cheese 1,451.56 pounds; cost of food \$98.14, net profit \$119.82.

25 Guernseys: Weight gained 480 pounds, value \$21.63, milk 10,938.6 pounds, cheese 1,130.62 pounds; food \$76.25, net profit \$88.30.

25 Shorthorns: Weight gained 709 pounds, value \$31.91, milk 12,186.9 pounds, cheese 1,077.60 pounds; food \$99.36, net profit \$81.36.

A lady on the staff of the Buffalo Public Library kindly supplied Mr. G. P. Grout with a copy of Red Polled records at the Six Months' Test, and Mr. Rabald, Acting Chief of the Dairy Division, Department of Agriculture, Washington, D. C., kindly sent him photo-copies of the pages showing the details of the several breeds, as re-printed from "Hoard's Dairyman" (Vol. 32), and published by the Bureau of Animal Industry in 1905 as Bulletin No. 75. The list as published in the "Dairyman" showed the records as the cows were placed "in order of their profit on estimated butter." The number, 1 to 50, which appeared in the list, precedes the name of the cow. For the present reprint the cows are grouped according to their breed and utility, with the live weight at the beginning of the test, weight gained or lost during the six months, and the percentage thereof, following the name. The grouping is by Dual-Purpose and by Dairy Purpose. A report was presented to the Red Polled Cattle Club of America on December 4th, 1901, by the Committee of Three—Messrs. J. W. Martin and P. G. Henderson, and the Secretary, Mr. J. McLain Smith, and in a preceding page the facts and figures relating to the breed are quoted. It quoted the name, age, and date of last calving—which ranged from 42 to 70 days—before the test began. It also stated that experienced men, furnished by the various breeders' associations, spent months in making selections of representative breeds, with the result that the Ayrshire, Jerseys, Holsteins, Shorthorns, and French Canadians ["sent by the Canadian Government with one general superintendent, and with each of its different herds a general manager, expert in compounding rations, who was appointed by the several breed associations represented, as well as an experienced feeder or caretaker with each of the five herds"] were said by com-

petent authority to be "the finest lot of cattle of these breeds ever seen together." The report also said "the feed of each cow was weighed out daily and charged at prices fixed by the Exposition authorities" considerably higher than the average farm value.

The milk of each cow was weighed at each milking, three times a day, and credited to her. A composite sample of the milk was taken, and the per cent of fat ascertained every Wednesday by the Babcock. By this percentage, combined with the average of the lactometer reading, the total solids were determined.

A churning of the milk from each herd was made one day each week, and the week's yield of churned butter determined therefrom. Butter was credited at 25 cents per pound on a basis of 85 per cent butter fat. Total solids at 9 cents per pound.

The "Dairyman" statement of results makes no note of the date of calving other than by a footnote on five cows: No. 26 "did not calve for two weeks after test began;" No. 29 "did not calve till May 7th;" No. 31 and 45 "arrived 18 days late;" No. 48, "last calf, October, 1900." No. 40, Tryste, was that cow of the Red Polled lot which had given birth to her calf on February 18th, 1901, 70 days before the test began. Moreover, she was born on April 15th, 1888, at Whitlingham, near Norwich, and was transferred to America in the autumn of 1892, so that she did credit to her breed. It is well to note, when considering the gain in weight of most of the cows, the conclusion from tests made at the Minnesota Experimental Station from January 1st, 1893, as stated by Principal T. L. Haecker in Bulletin No. 67, dated April, 1900, that "it requires as much dry matter to produce a pound of gain in a cow while giving milk as it does to produce a pound of butter fat. . . . The chief factors that determine the adaptability of a cow for dairy work appear to be her feeding capacity, the proportion of her food needed for body maintenance, and the disposition made of the nutrients available for product."

The following are the several results of the Buffalo Tests:—

SHORTHORNS

15. Miss Molly: 1,075 lb., gain 134 lb., 12.465 per cent, milk 6,891.1 lb., fat 3.71 p. c., butter 301.17 lb., value 75.37 dol.; food 32.36 dol.; net profit on butter 43.01 dol.

34. Queen Bess: 1,105 lb., gain 192 lb., 17.375 p. c., milk 6,547.9 lb., fat 3.57 p. c., butter 275.71 lb., value 68.80 dol.; food 32.49 dol., net profit 36.31 dol.

35. Princess of Thule: 1,261 lb., gain 132 lb., 10.468 p. c., milk 5,885.7 lb., fat 3.82 p. c., butter 265.70 lb., value 66.20 dol.; food 32.49 dol., net profit 33.71 dol.

41. Rose 3d: 1,105 lb., gain 125 lb., 11.312 p. c., milk 6,192.8 lb., fat 3.31 p. c., butter 253.35 lb., value 63.31 dol.; food 32.37 dol., net profit 30.97 dol.

44. Daisy D.: 1,161 lb., gain 219 lb., 18.863 p. c., milk 6,054.4 lb., fat 3.43 p. c., butter 244.74 lb., value 61.18 dol.; food 32.38 dol., net profit 28.80 dol.

RED POLLED

2. 8025 Mayflower 2d A12: 1,134 lb., gain 66 lb., 5.812 p. c., milk 6,161.5 lb., fat 4.45, butter 323.15 lb., value 80.79 dol.; food 28.89 dol., net profit 52.10 dol.

14. 9011 Susie—U5: 1,187 lb., gain 38 lb., 2,918 p. c., milk 6,430.1 lb., fat 3.8 p. c., butter 287.50 lb., value 71.87 dol.; food 28.07 dol., net profit 43.80 dol.

30. 10202 Easter—P3: 834 lb., gain 99 lb., 11.87 p. c., milk

6,058.7 lb., fat 3.7 p. c., butter 263.96, value 65.99 dol.; food 27.83 dol., net profit 38.16 dol.

39. 8538 Flora 2d—X3: 1,068 lb., gain 102 lb., 9.55 p. c., milk 4628.4 lb., fat 4.29 p. c., butter 233.55 lb., value 58.38 dol.; food 26.28 dol., net profit 32.11 dol.

40. 5169 Tryste—T4: 1,036 lb., gain 44 lb., 4.244 p. c., milk 5,416.2 lb., fat 3.68 p. c., butter 234.97 lb., value 58.74 dol.; food 27.15 dol., net profit 31.59 dol.

BROWN SWISS

19. Belle T.: 1,039, loss 1 lb., milk 5,789.6 lb., fat 4.09 p. c., butter 278.45 lb., value 69.01 lb.; food 28.38 dol.; net profit 41.23 dol.

22. Eliza: 1,273 lb., gain 9 lb., .07 p. c. milk 6,407.9 lb., fat 3.8 p. c., butter 286.89 lb., value 64.30 dol.; food 31.12 dol., net profit 40.60 dol.

32. Hope of Minn: 935 lb., gain 83 lb., 8.87 p. c., milk 6,117.0 lb., fat 3.61 p. c., butter 259.85 lb., value 64.53 dol.; food 26.93 dol., net profit 38.02 dol.

36. Lucy B.: 1,193 lb., gain 81 lb., 10.678 p. c., milk 6,356.2 lb., fat 3.45 p. c., butter 258.13 lb., value 64.53 dol.; food 31.01 dol., net profit 33.52 dol.

42. Nicola: 1,208 lb., gain 63 lb., 5.215 p. c., milk 6,220.8 lb., fat 3.25 p. c., butter 238.12 lb., value 59.63 dol.; food 29.18 dol., net profit 30.35 dol.

JERSEYS

4. Primrose Park's Pride: 1,019 lb., gain 24 lb., 2,355 p. c., milk 4,639.4 lb., fat 5.64 p. c., butter 308.24 lb., value 77.06 dol.; food 26.81 dol., net profit 50.25 dol.

7. Queen May: 974 lb., gain 42 lb., 4,312 p. c., milk 5,313.1 lb., fat 4.74 p. c., butter 298.51 lb., value 71.63 dol.; food 27.17 dol., net profit 47.46.

10. Gipsy: 1,004 lb., loss 7 lb., milk 5,790.3 lb., fat 4.4 p. c. butter 300.21 lb., value 75.05 dol.; food 30.27 dol.; net profit 44.78.

12. Mossy of H.: 822 lb., gain 67 lb., 8.15 p. c., milk 5,762.4 lb., fat 4.27 p. c., butter 290.01 lb., value 72.53 dol.; food 28.01 dol., net profit 44.49 dol.

29. Roxina: 933 lb., gain 33 lb., 3.536 p. c., milk 5,451.9 lb., fat 3.98 p. c., butter 256.01 lb., value 64.00 dol.; food 27.12 dol., net profit 38.52 dol.

GUERNSEYS

1. Mary Marshall: 987 lb., gain 61 lb., 6.18 p. c. milk 5,611.0 lb., fat 5.36 p. c., butter 354.26 lb., value 88.56 dol.; food 29.16 dol., net profit 59.10 dol.

3. Christophon: 1,019 lb., gain 24 lb., 2,348 p. c., milk 6,270.1 lb., fat 4.26 p. c., butter 315.01 lb., value 77.06 dol.; food 28.40 dol., net profit 50.35 dol.

5. Procris of Paxtang: 839.1 lb., gain 1 lb., milk 5,992.6 lb., fat 4.43 p. c., butter 313.10 lb., value 78.27 dol.; food 28.78 dol., net profit 49.49 dol.

18. Viga: 1,094 lb., gain 76 lb., 6.9469 p. c., milk 5,020.1 lb., fat 4.59, butter 271.64 lb., value 67.91 dol.; food 26.16 dol., net profit 41.75 dol.

43. Madora: 958 lb., gain 30 lb., 3.111 p. c., milk 4224.8 lb., fat 4.36 p. c., butter 214.87 lb., value 53.72 dol.; food 24.36 dol., net profit 29.36 dol.

AYRSHIRE

8. Betsy 1st: 973 lb., gain 25 lb., 2.569 p. c., milk 7,041.5 lb., fat 3.59 p. c., butter 298.57 lb., value 74.64 dol.; food 28.57 dol., net profit 46.07 dol.

9. Pearl of Woodside: 912 lb., gain 80 lb., 8.711 p. c., milk 6,730.8 lb., fat 3.74 p. c., butter 296.07 lb., value 74.02 dol.; food 28.56 dol., net profit 45.46 dol.

10. Kirsty Wallace: 966 lb., gain 44 lb., 4.554 p. c., milk 6,469.7 lb., fat 3.83 p. c., butter 292.31 lb., value 73.08 dol.; food 27.74 dol., net profit 45.34 dol.

17. Alice 2d: 1,054 lb., gain 82 lb., 10.7779 p. c., milk 6,127.9 lb., fat 3.91 p. c., butter 282.15 lb., value 70.54 dol.; food 28.29 dol., net profit 42.25 dol.

28. Lady Frolic: 1,105 lb., loss 13 lb., milk 6,620.3 lb., fat 3.40 p. c., butter 265.51 lb., value 66.38 dol.; food 23.60 dol., net profit 42.89 dol.

HOLSTEINS

6. Beauty of Norval: 1,017 lb., gain 64 lb., 6.293 p. c., milk 8,140.7 lb., fat 3.42 p. c., butter 328.01 lb., value 82 dol., food 32.65 dol., net profit 49.35 dol.

13. Hulda Weyne: 989 lb., gain 55 lb., 6,573 p. c., milk 8,010.7 lb., fat 3.23 p. c., butter 305.79 lb., value 76.45 dol.; food 32.40 dol., net profit 44.05 dol.

20. Tidy Abbekirk: 1,008 lb., gain 101 lb., 10.0198 p. c., milk 7,659.1 lb., fat 3.28 p. c., butter 296.00 lb., value 71.00 dol.; food 32.97 dol., net profit 41.03 dol.

24. Inka Mercedes: 915 lb., gain 72 lb., 7.880 p. c., milk 8,028.3 lb., fat 3.05 p. c., butter 288.34 lb., value 72.08 dol.; food 32.45 dol., net profit 39.63 dol.

33. Meg: 1,314 lb.; gain 99 lb., 7,534 p. c., milk 7,391.0 lb., fat 3.25 p. c., butter 282.54 lb., value 70.71 dol.; food 34.11 dol., net profit 36.60 dol.

FRENCH CANADIAN

21. Denise Champienne: 720 lb., gain 64 lb., 8.888 p. c., milk 5,404.2 lb., fat 4.03 p. c., butter 256.53 lb., value 64.16 dol.; food 23.52 dol., net profit 40.64 dol.

22. Rouen: 794 lb., gain 27 lb., 3.526 p. c., milk 4,896.1 lb., fat 4.46 p. c., butter 257.20 lb., value 64.20 dol.; food 23.68 dol., net profit 40.26 dol.

25. Liena Flora: 1,030 lb., gain 63 lb., 8,842 p. c., milk 4,558.0 lb., fat 3.92 p. c., butter 252.54 lb., value 63.13 dol.; food 23.72 dol., net profit 39.41 dol.

38. Luna: 760 lb., gain 102 lb., 11.342 p. c., milk 5,048.5 lb., fat 3.79 p. c., butter 225.03 lb., value 56.26 dol.; food 23.52 dol., net profit 32.74 dol.

47. La Bouchette: 647 lb., gain 32 lb., 4.945 p. c., milk 3,819.6 lb., fat 3.67 p. c., butter 166.38 lb., value 41.59 dol.; food 18.65 dol., net profit 22.94 dol.

POLLED JERSEY

16. Queen: 648 lb., gain 101 lb., 11.558 p. c., milk 4,010.8 lb., fat 5.63 p. c., butter 265.98 lb., value 66.19 dol.; food 23.60 dol., net profit 42.89 dol.

26. Ora: 1,013 lb., loss 17 lb., milk 4,804.8 lb., fat 4.40 p. c., butter 249.36 lb., value 62.34 dol.; food 23.17 dol., net profit 39.17 dol.

27. Pride's Favourite: 665 lb., gain 71 lb., 10.676 p. c., milk 4,569.1 lb., fat 4.60 p. c., butter 217.71 lb., value 61.93 dol.; food 22.97 dol., net profit 38.96 dol.

37. Phyllis: 799 lb., gain 59 lb., 7.509 p. c., milk 4,430.0 lb., fat 4.38 p. c., butter 228.12 lb., value 57.03 dol.; food 23.83 dol., net profit 33.20 dol.

48. Justine: 647 lb., gain 32 lb., 4.945 p. c., milk 2,465.0 lb., fat 4.31 p. c., butter 124.95 lb., value 31.24 dol.; food 18.65 dol., net profit 22.94 dol.

DUTCH BELTED

31. Belle of Warwick: 935 lb., gain 83 lb., 8.980 p. c., milk 5,313.2 lb., fat 4.15 p. c., butter 259.80 lb., value 64.95 dol.; food 26.93 dol., net profit 38.02 dol.

45. Madeline: 1,028 lb., gain 77 lb., 7.490 p. c., milk 5,661.0 lb., fat 3.23, butter 215.26 lb., value 53.81 dol.; food 26.66 dol., net profit 27.15 dol.

46. Holland Creamery: 806 lb., gain 90 lb., 11.166 p. c., milk 5,287.3 lb., fat 3.36 p. c., butter 209.51 lb., value 52.38 dol.; food 27.21 dol., net profit 24.17 dol.

49. Merletta: 918 lb., gain 111 lb., 11.208 p. c., milk 4,715.4 lb., fat 3.23 p. c., butter 215.26 lb., value 53.81 dol.; food 26.66 dol., net profit 27.15 dol.

50. Alberta: 1,147 lb., gain 12 lb., 1.046 p. c., milk 3,916.6 lb., fat 3.09 p. c., butter 142.42 lb., value 35.60 dol.; food 24.11 dol., net profit 11.49 dol.

VERMONT EXHAUSTIVE ANALYSIS

VARIATIONS IN QUANTITY AND QUALITY OF MILK

Some eighteen years ago the annual report of the Vermont Experiment Station gave the result of an exhaustive analysis. A full record had been kept, at the station, of the milk of each cow, year after year, and many thousand analyses were made. A study of the records led to the following conclusions, which were given to the agricultural public by an American paper, present day folk having recognized that farmers' "guess work" must give place to "facts and figures," the statement is now reprinted as part of this essay on milk inheritance.

1.—All cows shrink in quantity of milk as they get further from calving. If they are farrow, this shrinkage in quantity is accompanied by almost no change in quality even until they go dry, provided they are still farrow. If they are in calf, the milk increases in quality as it decreases in quantity. This increase is slight, about one-twentieth during the first six months after calving, but becomes quite pronounced just before the cow goes dry.

2.—Cows that calve in the spring average giving more milk during the first three months after calving than those that calve in the fall. For the 7th, 8th, and 9th month this is reversed. Fall cows show smaller variations in the quantity of milk than cows that calve in the spring.

3.—The milk of a cow for the first few days or weeks after calving is very variable in quality. On the average, it is thinnest just after calving, becomes slightly richer during the next two weeks, and then holds almost uniform in quality for four or five months.

4.—Cows vary in the quality of milk from one milking to the next, and from day to day, the quality rising and falling without apparent cause. Such changes are usually within one per cent. of fat, though one cow was known to change 2.68 per cent in two days. The least change of any cows in the station herd during an entire period of lactation was 0.33 per cent fat, the average change 1.3 per cent, and the greatest change 2.78 per cent. The largest variation in yield of butter was from milk that required 20 lbs. to make a lb. of butter to a quality of milk which would require but 11.7 lbs. It is probably possible that cases may occur of a doubling of the richness of the milk during different times in the same period of lactation.

5. Just after calving the milk is poorer in fat and in solids not fat than just before the cows goes dry. The average drop in fat is 1.13 per cent., the greatest change being 2.35 per cent., the least 0.49 per cent. The average change in solids not fat is a fall of 0.47 per cent, with variations from a decrease of 1.95 to an increase of 0.42 per cent.

6.—Most cows give the same quality of milk year after year, beginning with this quality at the first calving. There is no general

tendency for the milk to become either richer or poorer as the cow grows older.

7.—From one calving to the next, cows may be expected to vary the general quality of their milk not much more than a sixth of one per cent of fat, and scarcely ever will show a variation of more than a quarter of one per cent.

8.—The milk of a heifer tends to agree very closely in the quality to that of her dam. The average variation is a third of one per cent of fat.

9.—The present cheap, rapid and easy methods of testing cows leave no excuse for any dairyman not knowing the quality of the milk of each one of his cows. If two tests are made, each of a mixed sample of four days' milk, one being taken six weeks after the cow calves, and the other six months after calving, the average of these two tests will agree almost exactly with the average quality of the milk given during the entire milking period. There will seldom be a difference of as much as a quarter of one per cent of fat.

10.—If it is desired to know from tests nearer together what quality of milk a cow gives, very accurate results will be obtained by making two tests 15 days apart, four months after the cow calves, each test being on a sample of four days' milk. The average of these two tests with one-eighth of one per cent of fat added is surprisingly near the truth for the average quality of the year's milk.

11.—In the long run just about the same results are obtained whether cows are tested once a month or twice a month.

12.—Cows that have been properly fed at the barn do not shrink in quality of milk when turned to pasture. They usually increase both in quality and quantity.

13.—Full feeding with grain at the barn and while the cows are on pasture produces a much larger flow of milk during April and May, and causes the flow to keep up considerably later in the fall.

AN AUSTRALIAN ANALYSIS

Some five years ago the Victoria (Australia) Journal reported from the Victorian Dairy Supervisor details of the testing and recording of a herd of 141 cows. Among these were several pedigree Ayrshire and Shorthorn cattle—"typical dairy stock," which came through the test of profitable milk production. The total quantity of milk delivered at the factory during the year was 769,000 lb. The supervisor said the average, 5,390 lb., was "a very fair return." The butter fat was a fraction over 4 per cent, save 3.3 in the month of June. The cost of grazing and handling a milking herd, allowing for the cost of labor, was set down at not less than 5 pounds, 10s. per cow a year. Allowing 10d. per lb. for butter fat and 1s. per gallon for skim milk, a cow yielding 3,000 lb. gave a profit of 12 s. 6d.; 3,500 lb., 1 pound 12s. 11d.; 4,000 lb., 2 pounds 13s. 4d.; 4,500 lb., 3 pounds 12s. 9d.; 5,000 lb., 4 pounds 14s. 2d. Thus much for 54 cows. The remaining 87 cows averaged 6,090 lb., and their average profit, 6 pounds 18s. 9d., was made up as follows:—21 each gave 5,500 lb., 29, 6,000 lb.; 11, 6,500 lb.; 6, 7,000 lb.; 7, 7,500 lb.; 2, 8,000 lb.; 1, 9,000 lb. "The performances of the good cows overshadow those of lower capacity, but the inferior cows eat perhaps as much and require the same attention and labor as those which yield ten times the income."

ADDENDA (DECEMBER, 1916)

THE BUFFALO TEST

The five Red Polled cows were, as stated in the Essay (page 23), handicapped in the test, two being 42 days in milk, two 54 days, and the 13-yr.-old Tryste—T4, 70 days. The original record appears on page 90. I have calculated, by the daily record of Davy 27th—H1 (page 30), the probable return—assuming that May 1st was the seventh day after calving. The return would probably have been: Marigold 2d 7,211.5 lb. milk, Susie 7,480.1 lb., Easter 6,973.7 lb., Flora 2d 5,543.4 lb., Tryste (then 13-yr.-old) 6,871.2 lb.

A THREE-YEAR-OLD RECORD

Mr. Grout, on November 29th, sent the Secretary, for presentation to the Red Polled Cattle Club of America at its annual meeting on December 6th, the following statement:

"38454 Lady Golden has broke the world's record for three-year old cows, formerly held by Jean Du Luth Beauty (A. R.), having made 508 lb. butter fat up to November 29th, with 20 days to finish her year's work. (Record with first calf). She had gained over a hundred pounds in live weight since starting her record."

Lady Golden, of the old Elmer L3 Family, was born on October 9th, 1912; live weight when the test began, 1,250 lb. Her dam [29276] Goldie—L3, the year after giving birth to Lady Golden being then 5-yr.-old, gave in the year 8,248.5 lb. milk, fat 304.43 lb.; and in the next year 9,289.1 milk, fat 360.99, in 333 days. In the first seven months of this year's test she had given 365 lb. fat. Her live weight, 1,300 lb.

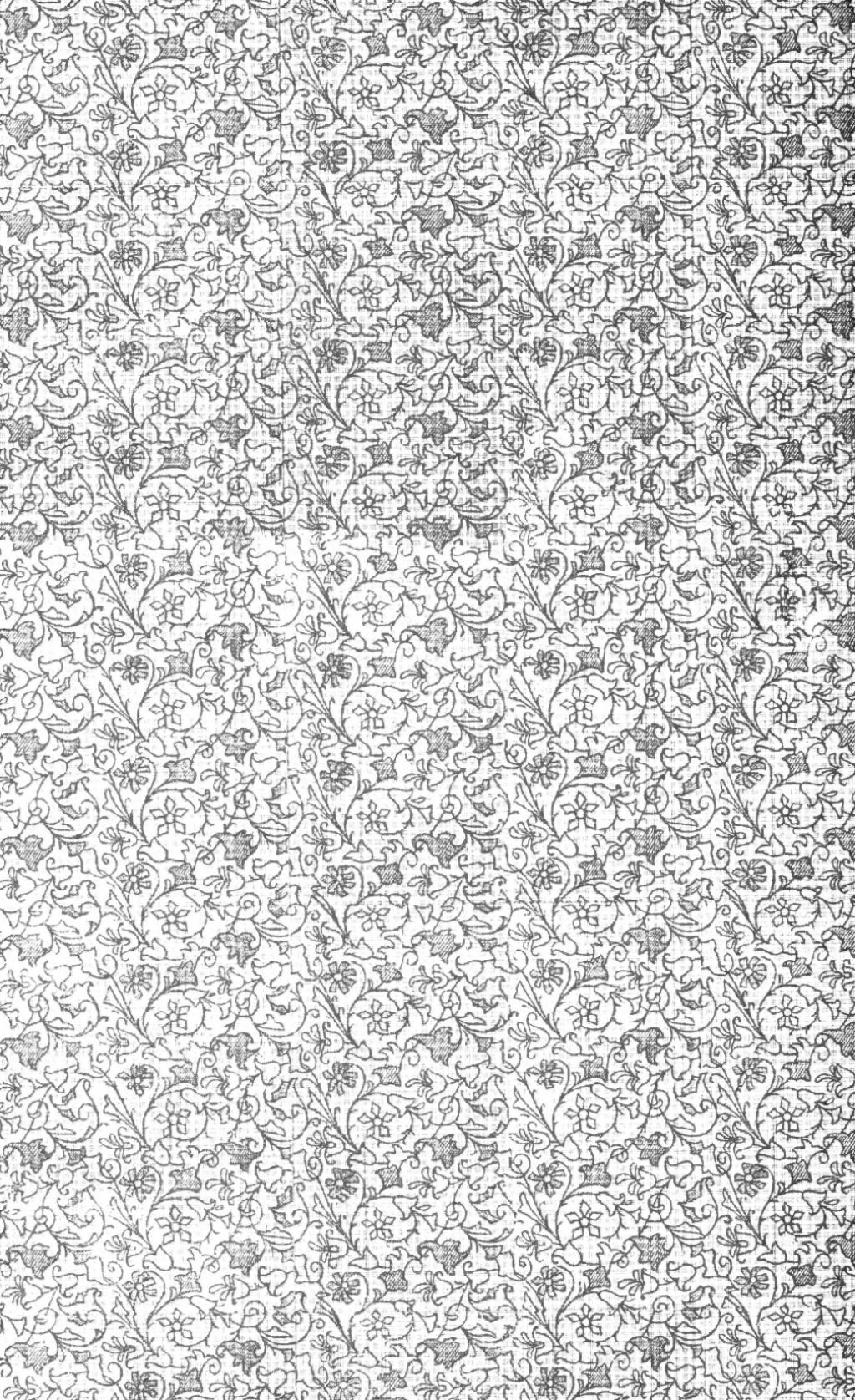
Ten of the Jean Du Luth Farm herd on November 29th averaged over 600 lb. (750 lb. butter—official test—in one year.

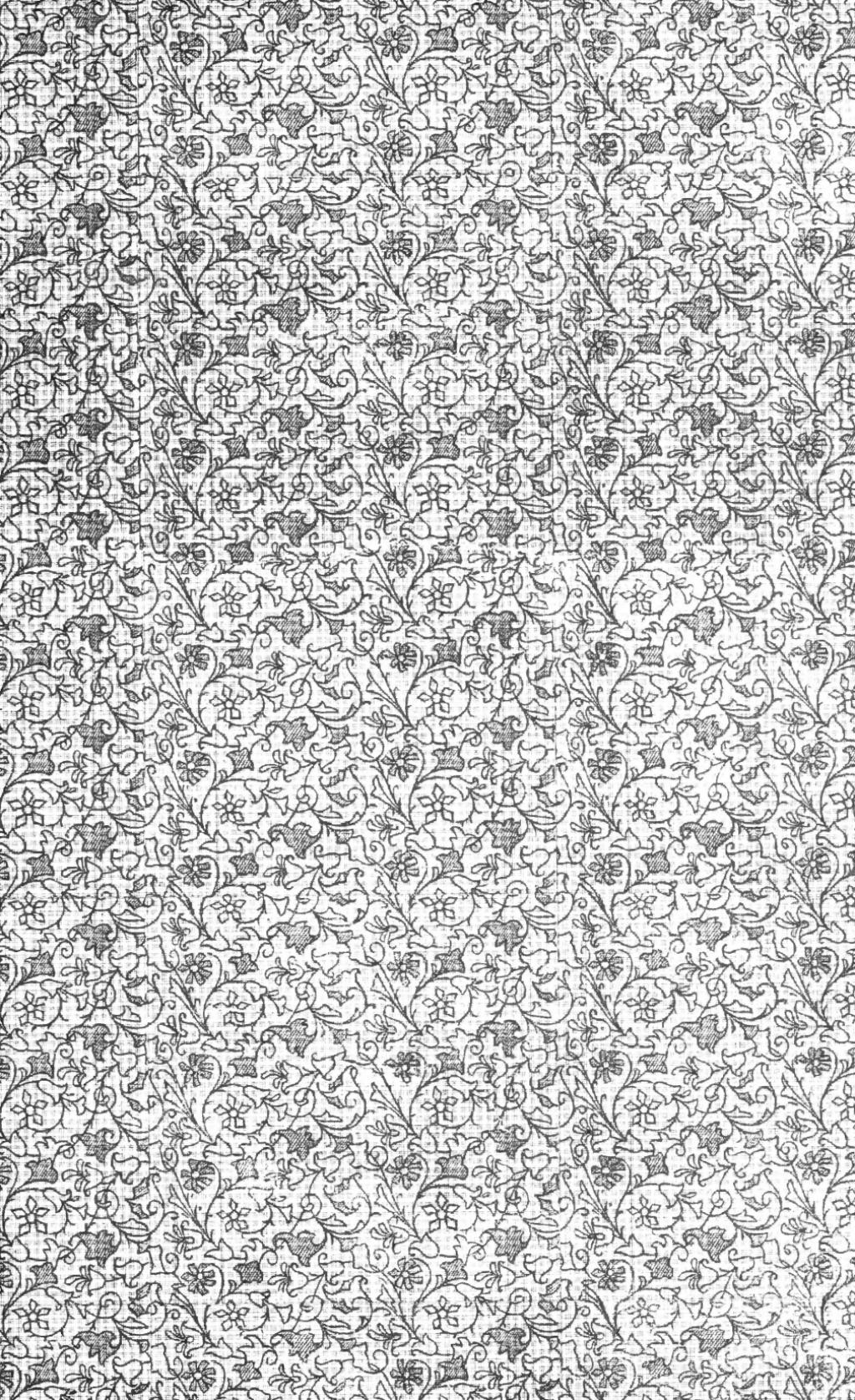
1915-16 MILK RETURNS

In the Longford Castle Herd, under normal conditions, 21069 Brilliantine—Q1, 10,207 lb. in 332 days; 18179 Mona—W3, 14,068 lb. in 329 days after her 19th calf. After her sixth calf she milked 576 days; total yield, 22,500 lb. Her grand total, from September 26th, 1905 (1st calf), to October 21st, 1916, 125,344 lb. in 3,504 days. As is shown on page 47 she was dry in the summer of 1912 173 days, there being a late effective service in 1911. She gave birth to her 11th calf a month ago.

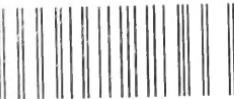
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